Proposed Plan **Date: June 8, 2015**

Operable Unit 7 – Plainwell Mill
Allied Paper, Inc./Portage Creek/Kalamazoo River Superfund Site
Plainwell, Allegan County, Michigan

INTRODUCTION

The purpose of this Proposed Plan is to: (1) present background information about the Plainwell Mill, Operable Unit 7 (OU7) of the Allied Paper, Inc./Portage Creek/Kalamazoo River Superfund site; (2) describe the various cleanup alternatives considered for addressing the contamination at OU7; (3) identify U.S. Environmental Protection Agency's (EPA's) preferred cleanup alternative and explain the reasons for that preference; and (4) solicit public review of and comment on the various alternatives evaluated.

This document is issued by EPA, the lead agency for site activities. The Michigan Department of Environmental Quality (MDEQ) is the support agency. In developing this Proposed Plan, EPA has reviewed and considered information in the Administrative Record, which provides additional detailed information about the site conditions. EPA will select a final remedy for OU7 after reviewing and considering all information submitted during the 30-day public comment period. EPA may modify the preferred alternative or select another response action presented in this Proposed Plan based on new information or public comments.

The public is encouraged to comment on this Proposed Plan. EPA will be accepting comments for 30 days from the issuance of this Proposed Plan. Members of the public are also encouraged to attend and participate in a public meeting at the Plainwell Area Community Center at 798 E. Bridge St., Plainwell, Michigan on June 16, 2015, at 6:00 pm.

EPA proposes the following remedial measures to clean up contaminated soil at OU7: 1) pre-design delineation and pre-excavation activities; 2) excavation and off-site disposal of contaminated soil, except for contaminated soils underlying existing concrete slabs; 3) containment beneath existing concrete slabs of a small amount of contaminated soil; 4) removal and off-site disposal of a former coal tunnel and associated former fuel oil lines; 5) backfill of excavation areas with clean fill; 6) restoration, as appropriate; and 7) institutional controls (ICs) and engineering controls. These cleanup measures will protect human health and the environment, will meet applicable and relevant and appropriate requirements (ARARs), and are cost-effective.

This Proposed Plan provides details on the preferred alternative for cleaning up the contaminated soil at OU7 as well as EPA's rationale for selecting this alternative. Groundwater contamination at OU7 will be addressed at a later time, if necessary, after the soil remedial action is completed. In addition, this Proposed Plan includes summaries of the other soil cleanup alternatives evaluated for use at OU7.

The final cleanup plan will be announced in local newspaper notices and presented in an EPA document called a Record of Decision (ROD), and could differ from this Proposed Plan

depending on information or comments EPA receives during the public comment period. Therefore, the public is encouraged to review and comment on all of the alternatives presented in this Proposed Plan.

Section 300.430(f) of the National Oil and Hazardous Substances Pollution Contingency Plan (NCP) requires EPA to issue this Proposed Plan for public comment. This Proposed Plan summarizes information that can be found in greater detail in the Remedial Investigation (RI) and Feasibility Study (FS) Reports and other documents contained in the Administrative Record for this site. EPA and MDEQ encourage the public to review these documents to gain a more comprehensive understanding of the site and Superfund activities that have been conducted at the site to date.

The supporting documents related to the proposed cleanup activities in this Proposed Plan can be found at any of the following locations, or online at http://www.epa.gov/region5/cleanup/kalproject/index.htm:

Kalamazoo Public Library
315 South Rose
Kalamazoo, MI

Allegan Public Library
331 Hubbard Street
Allegan, MI

Waldo Library
Western Michigan University
1903 West Michigan Avenue
Kalamazoo, MI

Otsego District Library
219 South Farmer Street
Otsego, MI

Charles Ransom Library
180 South Sherwood
Plainwell, MI

Saugatuck-Douglas Library
10 Mixer Street
Douglas, MI

EPA Records Center
Region 5 (SRC-7J)
77 W. Jackson Blvd.
Chicago, IL 60604
(312) 353-1063
Call for appointment

OU7 BACKGROUND

OU7 Location and History

OU7 is located at 200 Allegan Street in Plainwell, Allegan County, Michigan, and is part of the Allied Paper, Inc./Portage Creek/Kalamazoo River Superfund National Priorities List site. The location of OU7 is shown on Figure 1. OU7 is approximately 35.6 acres in size, includes the former Plainwell, Inc. mill property and buildings, and is currently zoned as Central Business District. OU7 is bordered by the following properties:

North: by the Kalamazoo River to the top of the bank, and beyond by residential and commercial properties;
East: by the Mill Race (a surface water body) to the top of the bank, and beyond by commercial properties and Main Street North;
South: by Allegan Street/M-89, and beyond by residential and commercial properties; and
West: by residential properties and the City of Plainwell Water Renewal Plant, and beyond by US-131.

The mill property that comprises OU7 was originally developed in 1896 as part of the Michigan Paper Company. Buildings currently on the property were constructed between 1906 and 1995 and are shown on Figure 2.

Paper mill operations at OU7 included the manufacturing of paper products and recycling of paper materials (which included the process of de-inking and use of caustic chemicals such as calcium carbonate), paper sludge dewatering, wastewater treatment, waste storage, raw materials storage, storage of coal, storage of fuel and hydraulic oils, and general manufacturing-related activities. Available information indicates that the mill produced "coated and uncoated book and cover release base and technical specialty paper products." Wastewater sludge was created during the papermaking processes. The sludge was processed through a series of clarifiers before entering the former wastewater lagoons for dewatering. In the late 1950s and early 1960s, paper that was de-inked and recycled at the mill included carbonless copy paper containing polychlorinated biphenyls (PCBs) and inks containing heavy metals. De-inking was discontinued at the mill in 1963. Processed wastewater was treated in the on-site wastewater treatment plant and paper waste from mill operations was treated in the former Sludge Dewatering Building (the Public Safety Building on Figure 2). These operations were located in the central portion of OU7. The former Quality Products Building and a recreational vehicle and camping supply retail store also operated in the central portion OU7, west of the former Sludge Dewatering Building**.**

The western portion of OU7 along the riverbank was historically occupied by the former wastewater settling lagoons. Most of the waste residuals were dredged from the lagoons and the excavated areas were backfilled with soil. The remaining papermaking waste residuals from various settling lagoons were consolidated into the four westerly lagoons, which are currently covered with soil and vegetation. The former lagoons were filled to approximately the adjacent grade. A vacant wooded lot is present on the southwestern portion of the property. A significant portion of OU7 is covered with buildings, concrete slabs or asphalt pavement, but there are areas, primarily along the riverbank, where vegetation is present.

During the time of papermaking operations, 1884-2000, ownership of the property and facilities comprising OU7 passed between various entities. The last operating owner, Plainwell, Inc., filed for bankruptcy in 2000 and the City of Plainwell subsequently purchased the property in August 2006 with the objective of redeveloping the property.

As part of the ongoing property redevelopment activities, portions of the former Mill Buildings (buildings 3A, 9A, 9B, 9C, 9D, 9E, 9F, 23, 25, and 28; see Figure 2) were razed in 2012 and 2013. The Quality Products Building, sludge dewatering tank, Specialty Minerals Building, Fuel

Oil #6 above-ground storage tank (AST), and Wastewater Treatment Plant were also demolished as part of the ongoing redevelopment activities. The former Sludge Dewatering Building was renovated for use by the City of Plainwell Public Safety Department, with occupancy in late 2012.

On July 18, 2011, ownership of the eastern portion of OU7, including Building 17 and Building 18, was transferred to Conestoga-Rovers and Associates 200 Allegan Street LLC (CRA). CRA conducted renovation activities on offices and access ways. In March 2012, CRA moved its Kalamazoo, Michigan, office staff into Building 17 and now occupies the top floor of this building.

The City of Plainwell renovated Building 19 for City Hall operations, which began at that location in June 2014. Additionally, the City of Plainwell currently utilizes portions of the property for fire hose assessments, ambulance driver testing, and storage of various seasonal decorative supplies.

OU7 Investigations

Weyerhaeuser Company (Weyerhaeuser) completed an RI in 2013 under EPA oversight. The RI identified contaminants of concern (COCs) that pose potential risks to human health and/or the environment, including metals, semi-volatile organic compounds (SVOCs), volatile organic compounds (VOCs), PCBs, cyanide (total), nitrate, and phosphorus. The primary COC at OU7 is arsenic. Arsenic, a naturally occurring element, is found throughout the environment and is released into the air by volcanoes, the weathering of arsenic-containing minerals and ores, and by commercial or industrial processes.

The United States and Weyerhaeuser entered into a Consent Decree, effective in February 2005, for the design and implementation of certain response actions at OU4 and OU7 of the Allied Paper, Inc./Portage Creek/Kalamazoo River site. The OU7 RI was conducted in a phased approach from November 2009 to February 2013. The significant findings and conclusions from the characterization activities completed during the RI are summarized below. Additional details are provided in the Final RI Report.

The results of the RI were evaluated relative to anticipated future land use scenarios based on the current redevelopment plan, which includes 11 primary redevelopment areas as listed below and shown on Figure 3.

OU7 Redevelopment Areas
Residential Area 1
Residential Area 2
Residential Area 3
Residential Area 4
Waterfront Plaza
Mixed Residential/Commercial Area 1
Mixed Residential/Commercial Area 2
Commercial Area 1
Commercial Area 2
Commercial Area 3
Commercial Area 4

Previous Response Actions Adjacent to OU7

From 2007-2009, under EPA oversight, Weyerhaeuser conducted emergency response actions at the southern banks of the Kalamazoo River adjacent to the OU7 property. The response actions were part of OU5 of the Allied Paper, Inc./Portage Creek/Kalamazoo River site and conducted concurrently with a time-critical removal action at the Plainwell Impoundment, also part of OU5. The Plainwell Mill river bank action had three objectives: 1) remove or contain visible paper residuals and address previously identified areas with PCB concentrations greater than 50 milligrams per kilogram (mg/kg) in soils and/or sediments along the river bank to a target concentration of 4 mg/kg or 1 mg/kg, respectively; 2) reconstruct the river bank, as needed, to minimize future releases of PCBs; and 3) reconfigure the banks to limit upland cutbacks into the former Plainwell Mill property, and place erosion controls to provide stability comparable to pre-excavation conditions. Excavation activities were conducted in four stages (Zone A through Zone D), each stage addressing a separate section of the adjacent river bank. Zones A through D were selected based on similar bank and/or river conditions and are depicted in Figure 4.

OU7 CHARACTERISTICS

This proposed plan addresses soil only. Groundwater is not part of the proposed plan, but information on groundwater is provided below for background purposes.

Hydrology, Geology, and Hydrogeology

The regional geology consists of unconsolidated glacial materials deposited during the last advance/retreat of the Laurentide Ice Sheet during the Wisconsinan Glacial Stage. These deposits consist of various amounts of gravel, sand, silt, and clay and are approximately 200 feet thick in this region. OU7 is located within the Kalamazoo River valley, which was likely formed as large amounts of water drained from the ice sheet. Underlying the glacial deposits are the consolidated bedrock formations of the Michigan Basin (a bowl-shaped structure with its approximate center located well to the northeast of this region). The immediate bedrock formation underlying the glacial deposits is the Mississippian Coldwater Shale. The Coldwater consists predominantly of gray to bluish-gray shale and is approximately 800 feet thick in this region.

The unconsolidated deposits beneath the OU7 property consist of various amounts of fill material (debris, clay, sand) and native unconsolidated glacial material and recent alluvium (sands, gravels, silts, and clay). The entire area consists predominantly of poorly graded fill material of fine to coarse grained sand, with fine to coarse grained gravel. Interbedded within the fill material are discontinuous lenses of concrete and brick debris, paper residuals, and sandy clay. Generally, within 10 to 15 feet below ground surface (bgs) across the property, native materials consist of poorly graded, fine to medium sand with fine to coarse gravel and lenses of poorly graded fine to coarse grained gravel with sand.

Groundwater is encountered in the uppermost, unconfined water-bearing zone between 5 and 17 feet bgs across OU7, with elevations ranging from approximately 713 to 714 feet above mean sea level (AMSL) (east side of OU7) to 711 to 712 feet AMSL (west side of OU7). At one location, the native sand and gravel at OU7 was found to be underlain by a layer of silt and clay

at approximately 32 feet bgs. Previous production supply wells once utilized in the manufacturing process also encountered this silt and clay unit at approximately 30 to 40 feet bgs. The groundwater discussion in this Proposed Plan is limited to the uppermost, unconfined water bearing zone.

Hydraulically, the Mill Race is approximately six feet higher than the Kalamazoo River. Based on information collected to date and presented in the RI Report, the uppermost, unconfined, water table aquifer present on the east side of OU7 appears to be recharged by the surface water within the Mill Race as a result of the dam located east of OU7. Groundwater flow within this water table aquifer is predominantly to the west from the Mill Race (flowing sub-parallel to the flow of the Kalamazoo River) across OU7. The hydraulic gradient along the northwestern portion of OU7, at times of higher groundwater elevations, appears to be discharging to the Kalamazoo River.

The actual groundwater-surface water interaction is a more complicated dynamic system at a local scale, with interactions to some degree where surface water and the groundwater are likely mixing. This can be inferred near monitoring well MW-7, where it appears there may be local groundwater discharge to the Kalamazoo River on an intermittent basis. More detailed information regarding groundwater flow is presented in the RI and FS Reports. Figure 5 provides the April 2014 groundwater flow contours for the uppermost aquifer across OU7 and shows the location of all site monitoring wells. Other groundwater figures can be found in the RI Report.

Vertical hydraulic gradients within the aquifer itself are minimal, with a slight upward component at monitoring wells MW-4S/D and MW-12S/D and a slight downward gradient at monitoring wells MW-21S/D.

Current and Past Groundwater Use in the Mill Area

The groundwater below OU7, including the uppermost aquifer, is classified as a drinking water aquifer but is not currently used as a source of drinking water. The City of Plainwell provides potable water to the surrounding area via three wells which draw groundwater from the deeper regional aquifer.

Mill operations were historically supplied by seven on-site groundwater wells, including four process water wells, two wells for fire suppression purposes, and one well for non-sanitary purposes, located near the wastewater treatment system. Based on observations during on-site activities, two of the process wells are no longer present. No documentation regarding the abandonment of these wells was available. One of the two fire suppression wells could not be located.

Nature and Extent of Contamination

Soil

Soil sample results generated during the pre-RI activities and the RI were evaluated against the following Generic Residential and Non-Residential Cleanup Criteria and Screening Levels established in Part 7 of the Michigan Administrative Rules (effective December 30, 2013) pursuant to Part 201, Environmental Remediation, 1994 PA 451 as amended:

- State Default Background Level (SDBL)(as applicable)
- Drinking Water Protection Criteria (DWPC)
- Groundwater Surface Water Interface Protection Criteria (GSIPC)
- Soil Volatilization to Indoor Air Inhalation Criteria (SVIAC)
- Volatile Soil Inhalation Criteria (VSIC)
- Particulate Soil Inhalation Criteria (PSIC)
- Direct Contact Criteria (DCC)
- Soil Saturation Concentration Screening Levels (Csat)

Additionally, PCB soil sample results were evaluated against the Toxic Substances Control Act (TSCA) standard of 1 mg/kg found at 40 Code of Federal Regulations (CFR) 761.61(a)(4)(i)(A). The 1 mg/kg standard in 40 CFR 761.61(a)(4)(i)(A) is referred to in this document as the Cleanup Level for Bulk PCB Remediation Waste in High Occupancy Areas (Without Further Conditions).[1]

Based on observations during development of the property and subsurface RI activities, fill materials of various compositions (i.e., various soil types, brick, concrete, coal, fly ash, etc.) are present in numerous areas of the property. A number of metals exceeding Part 201 Generic Residential and Non-Residential Cleanup Criteria were found in soil samples, which may be attributed to the fill material. Additionally, at a number of locations soil concentrations of metals exceed the Michigan SDBLs as well as county-specific background values for Allegan County found on the United States Geological Survey website. The majority of the exceedances in soil are located within or immediately below various areas of fill materials.

Table 1 lists the OU7 COCs for soil and shows the maximum concentrations exceeding Part 201 Generic Residential and Non-Residential Cleanup Criteria for soil in each redevelopment area. In general, the majority of the exceedances in soil are limited to the Part 201 DWPC and GSIPC. These protection criteria relate to the groundwater pathway and are not relevant to this Proposed Plan. The remaining exceedances in soil are as follows: (1) benzene exceeds its Part 201 SVIAC; (2) benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, dibenz(a,h)anthracene, indeno(1,2,3-cd)pyrene, total PCBs, arsenic, iron, and lead exceed their Part 201 DCC; and (3) arsenic and manganese exceed their Part 201 PSIC. Table 1B is a simplified version of Table 1 which lists the OU7 COCs for soil and shows the maximum concentrations exceeding Part 201 Generic Residential and Non-Residential Cleanup Criteria for soil excluding the groundwater protection criteria (Part 201 DWPC and GSIPC) for each redevelopment area.

Groundwater

Groundwater sample results were evaluated against the following Part 201 Generic Residential and Non-Residential Cleanup Criteria:

- Drinking Water Criteria (DWC)
- Groundwater Surface Water Interface Criteria (GSIC)

[1] 40 CFR 761.61(a)(4)(i)(A) also contains a cleanup standard of 10 mg/kg, referred to in this document as the Cleanup Level for Bulk PCB Remediation Waste in High Occupancy Areas (With Further Conditions). The TSCA cleanup standards will be discussed in more detail in the "Preliminary Remediation Goals" section of this Proposed Plan.

- Groundwater Volatilization to Indoor Air Inhalation Criteria
- Groundwater Contact Criteria
- Acute Inhalation Screening Levels
- Flammability and Explosivity Screening Level
- Water Solubility Limits

The groundwater exceedances in monitoring wells are shown in Figure 6. Groundwater contaminant concentrations exceed only the Part 201 DWC and GSIC. The relevant criteria are listed in the upper right-hand corner of Figure 6. Arsenic exceeds Part 201 DWC and GSIC at MW-7 and MW-12S, located along the Kalamazoo River at the northeastern and northwestern portions, respectively, of OU7. Iron and manganese exceed Part 201 DWC at numerous monitoring wells throughout OU7 (see Figure 6). Aluminum and lead exceed Part 201 DWC only at MW-3 in the northeastern portion of OU7. Use of groundwater at OU7 is currently restricted.

EPA has established primary drinking water standards for arsenic and lead. The standard for arsenic, known as a maximum contaminant level (MCL), and the standard for lead, known as treatment technique (TT) action level, are shown on Figure 6. The arsenic MCL is the same as the Part 201 DWC and GSIC. The lead TT action level is higher (less stringent) than the Part 201 DWC. There are no MCLs or TT action levels for aluminum, iron, or manganese, but EPA has established secondary MCLs for these constituents. Secondary MCLs are related to aesthetic qualities of groundwater rather than being health-based standards.

SCOPE AND ROLE OF THE ACTION

EPA expects that the preferred alternative, Alternative 3B, will be the final action for contaminated soil at OU7 and will meet all of the remedial action objectives (RAOs) for soil. This proposed response action addresses only OU7 and does not address any of the other OUs of the Allied Paper/Portage Creek/Kalamazoo River site. Each site OU is being addressed separately. With the exception of ensuring that continuing sources of PCBs to the river are controlled prior to cleaning up the contaminated sediments in OU5 (which consists of the Kalamazoo River and a portion of Portage Creek), the cleanup schedules for the various site OUs do not depend on each other.

EPA's proposed strategy for cleaning up OU7 is to excavate the majority of the contaminated soils and dispose of them off site to significantly reduce to protective levels future risks to human health and the environment from soils. The remaining contaminated soils will remain controlled in place beneath concrete slabs. The proposed response action does not address groundwater, but the preferred soil alternative may end up reducing to acceptable levels the risks associated with future exposure to groundwater. Once the soil remedy is completed, EPA will evaluate groundwater to determine if any unacceptable risks remain at OU7. If groundwater at OU7 continues to pose an unacceptable risk, a separate remedy for groundwater will be evaluated.

No principal threat waste materials have been identified at OU7. Instead, the contaminated soils are considered low-level threat waste materials. EPA defines low-level threat wastes as those source materials that generally can be reliably contained and that could present only a low risk in

the event of release. They include source materials that exhibit low toxicity, low mobility in the environment, or that are near health-based levels.

SUMMARY OF OU7 RISKS

As part of the OU7 RI, a baseline human health risk assessment (BHHRA) was conducted to evaluate the risks to humans associated with current and potential future exposure to OU7 contaminants in soil and groundwater, and a screening level ecological risk assessment (SLERA) was conducted to assess risks to ecological receptors in the OU7 terrestrial habitats adjacent to the Kalamazoo River. A baseline ecological risk assessment (BERA) previously was conducted for the entire Kalamazoo River as part of OU5 of the Allied Paper/Portage Creek/Kalamazoo River site, so the river and its banks were not evaluated during the OU7 ecological risk assessment. Any ecological risks associated with the Kalamazoo River will be addressed by separate OU5 response actions.

EPA believes that the cleanup measures identified in the preferred alternative in this Proposed Plan, or other active measures considered in the Proposed Plan, are necessary to protect public health and the environment from actual or threatened releases of hazardous substances into the environment.

Human Health Risks

A human health risk assessment estimates the "baseline risk." This is an estimate of the likelihood of developing cancer or non-cancer health effects if no cleanup action were taken at a site. To estimate the baseline risk at a Superfund site, EPA undertakes a four-step process:

Step 1: Analyze Contamination
Step 2: Estimate Exposure
Step 3: Assess Potential Health Dangers
Step 4: Characterize Site Risk

In Step 1, EPA looks at the concentrations of contaminants found at a site as well as past scientific studies on the effects these contaminants have had on people (or animals, when human studies are unavailable). Comparisons between site-specific concentrations and concentrations reported in past studies help EPA determine which contaminants are most likely to pose the greatest threat to human health.

In Step 2, EPA considers the different ways that people might be exposed to the contaminants identified in Step 1, the concentrations that people might be exposed to, and the potential frequency and duration of exposure. Using this information, EPA calculates a "reasonable maximum exposure" scenario, which portrays the highest level of human exposure that could reasonably be expected to occur.

In Step 3, EPA uses the information from Step 2 combined with information on the toxicity of each chemical to assess potential health risks. EPA considers two types of risk: cancer risk and non-cancer risk. The likelihood of any kind of cancer resulting from a Superfund site is generally expressed as an upper bound probability; for example, a "1 in 10,000 chance." In other words,

for every 10,000 people that could be exposed, one extra cancer may occur as a result of exposure to site contaminants. An extra cancer case means that one more person could get cancer than would normally be expected from all other causes. For non-cancer health effects, EPA calculates a "hazard index" (HI). The key concept here is that a "threshold level" (measured usually as an HI of less than 1) exists below which non-cancer health effects are no longer predicted.

In Step 4, EPA determines whether site risks are great enough to cause health problems for people at or near the Superfund site. The results of the three previous steps are then combined, evaluated and summarized.

The RI sample results from OU7 were evaluated in the BHHRA to identify the COCs in the various media that pose a current and/or future potential risk to human receptors. A contaminant was carried through the risk assessment if it was within or greater than EPA's acceptable risk range of $1x10^{-4}$ (1 in 10,000 chance) to $1x10^{-6}$ (1 in 1,000,000 chance) for cancer risks or exceeded an HI of 1 for non-cancer risks. The calculated cancer risks and non-cancer hazards greater than EPA's risk range ($1x10^{-4}$ or HI=1) are shown by redevelopment area in Table 2 and Table 3 for soil and groundwater, respectively. The Waterfront Plaza, Commercial Area 1, and Commercial Area 2 do not present a risk from soil greater than EPA's risk range. The Waterfront Plaza, Commercial Area 1, Commercial Area 2, Commercial Area 3, and Commercial Area 4 do not present a risk from groundwater greater than EPA's risk range. Surface water and sediment have no identified complete exposure pathway for human exposures and were not evaluated in the BHHRA.

For each chemical reported in each medium associated with the exposure areas, comparisons were made to Michigan's Part 201 cleanup criteria and Part 213 risk-based screening levels (RBSLs) presented in operational memoranda for MDEQ's Remediation and Redevelopment Division. ***Operational Memorandum No. 1*** includes cleanup criteria and RBSLs for multiple exposure pathways. For soils, the screening values that were used for COC selection were based on the minimum cleanup criterion and/or RBSL protective of the direct contact, groundwater protection (drinking water), groundwater protection (direct contact), ambient air, indoor air, and soil saturation exposure pathways for soil. In general, the Part 201 criteria are chemical concentrations that correspond to a cancer risk of $1x10^{-5}$ (1 in 100,000 chance) or a non-cancer HI of 1. COCs were identified as constituents that had one or more exceedances of the Part 201 criteria. A summary of the COCs that showed exceedances of Part 201 are shown in Table 1 (by redevelopment area) for soil and in Figure 6 for groundwater.

Ecological Risks

A SLERA was performed for ecological receptors in the terrestrial habitats adjacent to the Kalamazoo River near Plainwell Mill to supplement the approved BERA for the Kalamazoo River and adjacent aquatic habitats. The OU7 SLERA evaluated the terrestrial areas up to the top of the river bank.

Because the majority of OU7 terrestrial habitat adjacent to the river is anticipated to be redeveloped for residential and/commercial use, only the riparian corridor along the Kalamazoo

River was evaluated for ecological risk. The SLERA identified a potential for risk to avian and/or mammalian wildlife from the following site-related contaminants in the riparian corridor of OU7: carbazole, high molecular weight (HMW) polycyclic aromatic hydrocarbons (PAHs), cadmium, copper, lead, mercury, selenium, and zinc.

REMEDIAL ACTION OBJECTIVES

Remedial Action Objectives are goals for protecting human health and the environment from risks associated with current or potential future exposures. The RAOs to address soil at OU7 are as follows:

- RAO 1 - Prevent unacceptable human direct contact (incidental ingestion, dermal contact, and ambient air inhalation) exposure to soil impacted with VOCs, SVOCs, PCBs, metals, and other inorganics.
- RAO 2 - Mitigate the potential for unacceptable human inhalation exposure to indoor air vapors resulting from contaminated soil.
- RAO 3 - Prevent unacceptable avian and mammalian receptor exposure to surface soil in wooded riparian areas along the Kalamazoo River.
- RAO 4 - Protect surface water and sediments by mitigating the potential for erosion of soil to the Kalamazoo River and Mill Race.

This Proposed Plan includes RAOs and cleanup alternatives for soil only. Since there is some groundwater contamination at OU7 with associated risks exceeding the acceptable risk range, additional groundwater monitoring and, if necessary, groundwater risk evaluations, will be conducted after the soil remedial action is implemented. The soil remedial action may end up reducing to acceptable levels the risks associated with future exposure to groundwater. However, if determined to be necessary based on the results of the additional groundwater evaluation, groundwater will be addressed in an FS Addendum and separate Proposed Plan and ROD.

PRELIMINARY REMEDIATION GOALS

Preliminary remediation goals (PRGs) are risk-based or ARAR-based chemical-specific concentrations used in developing and evaluating potential cleanup alternatives for a site. PRGs are considered “preliminary” until final cleanup levels are established in a ROD.

EPA developed the PRGs for OU7 soil based both on protective risk-based calculations in the BHHRA/SLERA and a review of the potential federal and state ARARs. The potential ARARs are provided in Table 4.

PRGs to Protect Human Health

With the exception of arsenic and PCBs, the soil PRG for each COC in each specific redevelopment area is the appropriate Part 201 residential or non-residential cleanup criterion, based on the anticipated future land use of each redevelopment area. The Part 201 soil criteria for the OU7 COCs are listed in Table 5.

In addition to the Michigan Part 201 criteria, risk-based concentrations (RBCs) for arsenic and PCBs and cleanup standards for PCBs found in federal regulations were evaluated as potential PRGs. OU7-specific RBCs were developed based on the target cancer risk levels of $1x10^{-6}$, $1x10^{-5}$, and $1x10^{-4}$ and the target non-cancer hazard quotient[2] (HQ) of 1.0 for individual chemicals. The 10^{-4} RBCs were dropped from consideration because they do not meet the Part 201 ARARs and were not considered viable PRGs. The TSCA self-implementing cleanup standards found at 40 CFR 761.61(a)(4)(i)(A) were considered as PRGs for PCBs for some of the cleanup alternatives. Specifically, 40 CFR 761.61(a)(4)(i)(A) states that the cleanup level for bulk PCB remediation waste in high occupancy areas is ≤1 mg/kg without further conditions. It goes on to say that high occupancy areas where bulk PCB remediation waste remains at concentrations >1 mg/kg and ≤10 mg/kg shall be covered with a cap which meets the requirements of paragraphs (a)(7) and (a)(8) of that same section of the regulations. As an alternative to using the self-implementing cleanup standards, the TSCA regulations at 40 CFR 761.61(c) allow for risk-based disposal approval, without further conditions, if it can be demonstrated that such an approach will not pose an unreasonable risk of injury to health or the environment. Risk-based cleanup numbers developed in accordance with CERCLA can therefore be used without the requirement for capping or other restrictions, in accordance with 40 CFR 761.61(c).

The following results were obtained from the PRG evaluation:

- The RBC calculated value for arsenic at the 10^{-6} risk level with an HQ of 1.0 was below the Part 201 SDBL of 5.8 mg/kg. If cleanup to those risk levels was selected, the SDBL would be the PRG, since it is not practicable to clean up a site to below background levels.
- The RBC calculated value for arsenic at the 10^{-5} risk level is 6.4 mg/kg for residential land use and 27 mg/kg for non-residential/commercial land use.
- The RBC calculated value for PCBs at the 10^{-6} risk level with an HQ of 1.0 was below the TSCA Cleanup Level for Bulk PCB Remediation Waste in High Occupancy Areas (Without Further Conditions) of 1 mg/kg. Some of the remedial alternatives therefore use the following proposed PRGs for PCBs:
    - Residential Areas – 1 mg/kg based on TSCA Cleanup Level for Bulk PCB Remediation Waste in High Occupancy Areas (Without Further Conditions)
    - Non-Residential/Commercial Areas – 10 mg/kg based on TSCA Cleanup Level for Bulk Remediation Waste in High Occupancy Areas (With Further Conditions)
- The RBC calculated value for PCBs at the 10^{-5} risk level is 2.5 mg/kg for residential land use and 9.1 mg/kg for non-residential/commercial land use.

[2] A hazard quotient is a measure of the potential for adverse effects through exposure to an individual chemical. The HQ is based on a comparison of the chemical's concentration to a known reference dose. An HQ less than 1 indicates no potential for adverse effects, while an HQ greater than 1 indicates that adverse effects are possible. The hazard index or HI is the sum of all the HQs that affect a specific organ, such as the liver, and represents the potential impact to that organ based on all chemicals that could impact that organ.

Table 6 shows the PRGs by redevelopment area for each remedial alternative, including the PRGs for arsenic and PCBs.

PRGs to Protect the Environment

The PRGs for each contaminant of potential ecological concern (COPEC) within the riparian corridor along the river were developed consistent with EPA guidance to address potential risks to ecological receptors. As shown in Table 7, the 95 percent upper confidence limit (95% UCL) concentration of each COPEC at OU7 was compared to its ecological PRG. The 95% UCL concentrations for carbazole, HMW PAHs, cadmium, copper, mercury, selenium, and zinc are below their ecological PRGs. For these seven COPECs, the 95% UCL is less than 50 percent of the PRG. This indicates that for the soil in the riparian corridor along the Kalamazoo River, concentrations of carbazole, HMW PAHs, cadmium, copper, mercury, selenium, and zinc are protective of avian and mammalian wildlife, and risk management is not required for these COPECs.

For lead, a range of potential PRGs was evaluated due to the uncertainty associated with the concentrations at which lead affects avian receptors. The lower end and upper range PRGs are 140 mg/kg and 812 mg/kg, respectively. The 95% UCL lead concentration in the areas of potential ecological exposure is 181 mg/kg, which falls between the lower end and upper end PRGs. The 95% UCL is 22 percent of the upper end PRG, so action would not be required to achieve the upper range PRG for lead. The maximum detected concentration of lead in the riparian corridor dataset is 990 mg/kg.

RAO 3 was developed to address the potential ecological risks identified in the SLERA. The remedial alternatives that were developed to meet the RAOs that address human health impacts (i.e., RAO 1 and RAO 2) will address the sample location with the highest concentration of lead in the riparian corridor, as well as the three other locations within the riparian corridor with lead concentrations exceeding the lower end PRG. Therefore unique remedial alternatives to address RAO 3 were not developed.

SUMMARY OF REMEDIAL ALTERNATIVES

Remedial alternatives for soil at OU7 are presented below. The alternatives are numbered to correspond with the numbering used in the 2015 FS Report. Additional details about the alternatives are provided in the FS Report. A comparison of the major remedy components of the various alternatives can be found in Table 8.

Exceedances of Part 201 soil criteria protective of the groundwater pathway, such as the DWPC and GSIPC, were not specifically or separately used in the evaluation of soil volumes that would be addressed under each remedial alternative because protection of groundwater is outside the scope of this Proposed Plan. The estimated soil volumes were based on the COCs and exceedances in soil shown in Table 1B.

Common Elements

Components that are common to all the alternatives except the "no-action" alternative (or other alternatives as noted below) are presented here to limit redundancy in the subsequent discussion of the individual alternatives. These common components are:

- Pre-remedial design delineation of the vertical and horizontal extent of soil contamination in each area exceeding the PRGs
- Pre-excavation activities which include, but are not limited to, the following: erosion control measures; purging the remaining buried fuel oil line from a former AST located in Mixed Residential/Commercial Area 2 to prepare for excavation activities; removal of fuel oil within an old coal tunnel located in Mixed Residential/Commercial Area 2 to prepare for excavation activities; abandonment of monitoring wells located in excavation areas; structural evaluation of the buildings to be affected by excavation activities; and limited asbestos abatement around the former coal tunnel and the exterior piping outside former Mill Buildings
- Excavation of areas impacted above the PRGs for soil
- Removal of coal tunnel and associated former fuel oil AST lines, along with any adjacent contaminated materials at concentrations above the PRGs
- Verification soil sampling to confirm that PRGs were met
- Backfilling of excavation areas with clean fill
- Restoration of excavated areas and other areas impacted by cleanup activities, as appropriate
- Monitoring and maintenance of engineering controls such as cap/cover and/or existing concrete slabs, as appropriate (this would not be needed for Alternative 3A)
- Institutional controls (this would not be needed for Alternative 3A)

ICs would be prepared and implemented consistent with the future land use plan for each redevelopment area. The ICs would include, but not be limited to, the following:

- Zoning and/or land use restrictions at OU7 consistent with future anticipated land use, including the requirement that existing building foundations/slabs remain in place as a barrier to contamination beneath them, unless addressed by an approved Soil Management Plan. A Soil Management Plan will be developed for OU7 addressing each area being redeveloped to ensure that soils that exceed PRGs and that remain at OU7 following completion of the remedial action cleanup work either: (1) remain in place, properly contained; (2) are relocated at similar locations/depths and properly contained; or (3) are disposed off-site in an appropriately licensed disposal facility.
- Designation of an area for use as a raised bed community garden for residential properties, and restrictive covenant(s) prohibiting gardens in other areas
- Prohibition of digging in areas not remediated to Part 201 Generic Residential Cleanup Criteria without proper training and protective measures
- Implementation of a restrictive covenant for contamination remaining in place above Part 201 Generic Residential Cleanup Criteria pursuant to Michigan Consolidated Laws 324.20120b

- Installation of permanent markers on the property identifying depth to which digging is prohibited, and enrollment of property in state-wide utility-location program to identify areas where digging is prohibited

Alternative 1: No Action

Regulations governing the Superfund program require that the "no action" alternative be evaluated generally to establish a baseline for comparison. Under this alternative, no action would be taken at OU7 to prevent exposure to contaminated soil.

Alternative 1 Costs
Estimated Capital Cost: $0
Estimated Annual Operation and Maintenance (O&M) Cost: $0
Estimated Present Worth Cost: $0

Alternative 2 Series: Excavation and On-Site Consolidation, with Some Off-Site Disposal

The Alternative 2 Series generally consists of the following: on-site consolidation/soil relocation for soils with inorganic concentrations greater than residential PRGs but less than non-residential/commercial PRGs; excavation and off-site disposal of soils with inorganic concentrations greater than non-residential/commercial PRGs or residential PSIC; excavation and off-site disposal of soils with VOCs, SVOC, or PCBs at concentrations greater than PRGs; and off-site disposal of materials containing coal or coal debris. Any consolidation/relocation of soils would be on a designated non-residential/commercial land use portion of OU7, and a gravel cover system would be placed over consolidated materials.

The Alternative 2 Series includes four different sub-alternatives, 2A, 2B, 2C, and 2D, which vary based on PRG type (i.e., Part 201 criteria, TSCA regulations, and/or OU7-specific risk-based PRGs) and land use considerations. The PRGs for each sub-alternative and OU7 redevelopment area are summarized in Table 6. The four sub-alternatives are described below.

Alternative 2A
Alternative 2A would use residential-based PRGs for all areas of OU7, regardless of land use (i.e., it would assume that all areas of OU7 were residential), to determine which soils need to be addressed and to estimate soil volumes. Contaminated soils under existing concrete slabs would be identified and excavated under this alternative. The Alternative 2A PRGs would include:

- Part 201 Generic Residential Cleanup Criteria for all COCs except PCBs
- TSCA Cleanup Level for Bulk PCB Remediation Waste in High Occupancy Areas (Without Further Conditions), 1 mg/kg total PCBs
- PRGs for all COCs would be met at all sampling locations throughout OU7

Since Alternative 2A would require the excavation of all soils exceeding residential PRGs and assumes all areas of OU7 are residential, there would be no suitable area for consolidation and capping of soils (i.e., there would be no designated non-residential/commercial portion of OU7). Because of this, Alternative 2A is not implementable and does not meet the general intent of the

Alternative 2 Series (i.e., on-site consolidation). Therefore, Alternative 2A was dropped from consideration and will not be discussed further in this Proposed Plan.

Alternative 2B

Alternative 2B would consider the land use of each individual redevelopment area. Existing concrete slabs would stay in place and engineering controls would be required to ensure any contamination under the slabs remained covered by the slabs. Except for PCBs, the PRGs would be based on Part 201 criteria. The PRGs for PCBs would be based on OU7-specific risk-based calculations. Under Alternative 2B, the following PRGs would be used (see Table 6) to determine which soils need to be addressed and to estimate soil volumes:

- Part 201 Generic Residential Cleanup Criteria for all COCs except PCBs would be applied to redevelopment areas with residential land use
- Part 201 Generic Non-Residential Cleanup Criteria for all COCs except PCBs would be applied to redevelopment areas with non-residential land use
- Risk-based PRGs for PCBs would be applied as follows:
    - Redevelopment areas with residential land use, 2.5 mg/kg total PCBs
    - Redevelopment areas with non-residential land use, 9.1 mg/kg total PCBs
- PRGs for all COCs except arsenic would be met at all sampling locations throughout OU7
- The Part 201 arsenic PRGs would be met using an iterative cleanup approach so that the "exposure point concentration" (EPC) within each exposure unit (i.e., each redevelopment area) would meet the appropriate residential (7.6 mg/kg) or non-residential (37 mg/kg) PRG, based on the direct contact criteria in Part 201.

The iterative approach for arsenic would essentially excavate the soils at sampling locations with the highest concentrations of arsenic until the arsenic EPC within each redevelopment area met the PRG. Each redevelopment area at OU7 represents a separate exposure unit, and the EPC is a conservative estimate of the average concentration[3] of arsenic in soil to which a receptor may be exposed within that exposure unit. Under this approach, the arsenic PRG would not necessarily be met at all individual sampling locations throughout OU7, but the average concentration of arsenic in soil within each exposure unit would meet the PRG.

Alternative 2B Costs and Volumes

Estimated Capital Cost: $4,319,869
Estimated Annual O&M Cost: $9,600
Estimated Present Worth Cost: $4,462,820
Estimated Metals-Impacted Soils Left In Place Under Concrete Slabs: 95 cubic yards (CY)
Estimated Soil Consolidated on OU7: 3,668 CY
Estimated Capping Material: 2,300 CY fill, 475 CY gravel
Estimated Soil Excavation: 20,807 CY
Estimated Construction Time: 4 months

[3] The EPC for each exposure area represents the 95% UCL of the mean concentration within each redevelopment area, calculated using EPA's ProUCL 5.0 statistical software.

Alternative 2C

Similar to Alternative 2B, Alternative 2C would consider the land use of each individual redevelopment area. Existing concrete slabs would stay in place and engineering controls would be required to ensure any contamination under the slabs remained covered by the slabs. Except for PCBs and arsenic, the PRGs would be based on Part 201 criteria. The PRGs for PCBs and arsenic would be based on OU7-specific risk-based calculations. Under Alternative 2C, the following PRGs would be used (see Table 6) to determine which soils need to be addressed and to estimate soil volumes:

- Part 201 Generic Residential Cleanup Criteria for all COCs except PCBs and arsenic would be applied to redevelopment areas with residential land use
- Part 201 Generic Non-Residential Cleanup Criteria for all COCs except PCBs and arsenic would be applied to redevelopment areas with non-residential land use
- Risk-based PRGs for PCBs would be applied as follows:
    - Redevelopment areas with residential land use, 2.5 mg/kg total PCBs
    - Redevelopment areas with non-residential land use, 9.1 mg/kg total PCBs
- Risk-based PRGs for arsenic would be applied as follows:
    - Redevelopment areas with residential land use, 6.4 mg/kg
    - Redevelopment areas with non-residential land use, 27 mg/kg
- PRGs for all COCs except arsenic would be met at all sampling locations throughout OU7
- The arsenic PRGs would be met using an iterative cleanup approach as described in Alternative 2B.

Alternative 2C Costs and Volumes

Estimated Capital Cost: $4,855,244
Estimated Annual O&M Cost: $9,600
Estimated Present Worth Cost: $4,998,195
Estimated Metals-Impacted Soils Left In Place Under Concrete Slabs: 185 CY
Estimated Soil Consolidated on OU7: 4,700 CY
Estimated Capping Material: 3,050 CY fill, 610 CY gravel
Estimated Soil Excavation: 26,514 CY
Estimated Construction Time: 5 months

Alternative 2D

Similar to Alternative 2B, Alternative 2D would consider the land use of each individual redevelopment area. Existing concrete slabs would stay in place and engineering controls would be required to ensure any contamination under the slabs remained covered by the slabs. Except for PCBs and arsenic, the PRGs would be based on Part 201 criteria. The PRGs for PCBs would be based on TSCA Cleanup Level for Bulk PCB Remediation Waste in High Occupancy Areas and the PRG for arsenic would be based on state-wide background levels. Under Alternative 2D, the following PRGs would be used (see Table 6) to determine which soils need to be addressed and to estimate soil volumes:

- Part 201 Generic Residential Cleanup Criteria for all COCs except PCBs and arsenic would be applied to redevelopment areas with residential land use
- Part 201 Generic Non-Residential Cleanup Criteria for all COCs except PCBs and arsenic would be applied to redevelopment areas with non-residential land use

- TSCA Cleanup Level for Bulk PCB Remediation Waste in High Occupancy Areas (Without Further Conditions), 1 mg/kg total PCBs, would be applied to redevelopment areas with residential land use and to the Waterfront Plaza redevelopment area
- TSCA Cleanup Level for Bulk PCB Remediation Waste in High Occupancy Areas (With Further Conditions), 10 mg/kg total PCBs, would be applied to all other redevelopment areas with non-residential land use; a cap would be required for areas where PCBs were left in place at concentrations between 1 mg/kg and 10 mg/kg, and deed restrictions requiring cap maintenance also would be required
- The arsenic PRG for all redevelopment areas would be the SDBL, 5.8 mg/kg
- PRGs for all COCs except arsenic would be met at all sampling locations throughout OU7
- The arsenic PRGs would be met using an iterative cleanup approach as described in Alternative 2B

Since Alternative 2D would require the excavation of all soils exceeding background concentrations of arsenic, this alternative would require the excavation of all areas of OU7. As a result, there would be no suitable area for consolidation and capping of soils because the arsenic concentrations in the excavated materials would not be allowed to be left on site. Because of this, Alternative 2D is not implementable and does not meet the general intent of the Alternative 2 Series (i.e., on-site consolidation). Therefore, Alternative 2D was dropped from consideration and will not be discussed further in this Proposed Plan.

Alternatives 3 Series: Excavation and Off-Site Disposal

The Alternative 3 Series generally consists of excavation and off-site disposal of contaminated soils. As opposed to the Alternative 2 Series, which includes on-site consolidation of some inorganics, no on-site consolidation would occur under the Alternative 3 Series. The following materials would be excavated and shipped off site for disposal under the Alternative 3 Series: soils with inorganics, VOCs, SVOCs, and PCBs at concentrations greater than PRGs; and material that contains coal or coal debris.

Similar to the Alternative 2 Series, the Alternative 3 Series includes four different sub-alternatives, 3A, 3B, 3C, and 3D, which vary based on PRG type (i.e., Part 201 criteria, TSCA regulations, and/or OU7-specific risk-based PRGs) and land use considerations. The PRGs for each sub-alternative and OU7 redevelopment area are summarized in Table 6. The four sub-alternatives are described below.

<u>Alternative 3A</u>
Alternative 3A would use residential-based PRGs for all areas of OU7, regardless of land use (i.e., it would assume that all areas of OU7 were residential), to determine which soils need to be addressed and to estimate soil volumes. Contaminated soils under existing concrete slabs would be identified and excavated under this alternative. The Alternative 3A PRGs would include:

- Part 201 Generic Residential Cleanup Criteria for all COCs except PCBs
- TSCA Cleanup Level for Bulk PCB Remediation Waste in High Occupancy Areas (Without Further Conditions), 1 mg/kg total PCBs
- PRGs for all COCs would be met at all sampling locations throughout OU7

Alternative 3A Costs and Volumes

Estimated Capital Cost: $9,388,744
Estimated Annual O&M Cost: $2,400
Estimated Present Worth Cost: $9,424,482
Estimated Metals-Impacted Soils Left In Place Under Concrete Slabs: not applicable (N/A)
Estimated Soil Consolidated On OU7: N/A
Estimated Capping Material: N/A
Estimated Soil Excavation: 56,446 CY
Estimated Construction Time: 11 months

Alternative 3B

Alternative 3B would consider the land use of each individual redevelopment area. Existing concrete slabs would stay in place and engineering controls would be required to ensure any contamination under the slabs remained covered by the slabs. Except for PCBs, the PRGs would be based on Part 201 criteria. The PRGs for PCBs would be based on OU7-specific risk-based calculations. Under Alternative 3B, the following PRGs would be used (see Table 6) to determine which soils need to be addressed and to estimate soil volumes:

- Part 201 Generic Residential Cleanup Criteria for all COCs except PCBs would be applied to redevelopment areas with residential land use
- Part 201 Generic Non-Residential Cleanup Criteria for all COCs except PCBs would be applied to redevelopment areas with non-residential land use
- Risk-based PRGs for PCBs would be applied as follows:
    - Redevelopment areas with residential land use, 2.5 mg/kg total PCBs
    - Redevelopment areas with non-residential land use, 9.1 mg/kg total PCBs
- PRGs for all COCs except arsenic would be met at all sampling locations throughout OU7
- The Part 201 arsenic PRGs would be met using an iterative cleanup approach so that the EPC within each exposure unit (i.e., each redevelopment area) would meet the appropriate residential (7.6 mg/kg) or non-residential (37 mg/kg) PRG. (See description of Alternative 2B for more information about the iterative cleanup approach.)

Alternative 3B Costs and Volumes

Estimated Capital Cost: $4,328,119
Estimated Annual O&M Cost: $2,400
Estimated Present Worth Cost: $4,363,857
Estimated Metals-Impacted Soils Left In Place Under Concrete Slabs: 95 CY
Estimated Soil Consolidated On OU7: N/A
Estimated Capping Material: N/A
Estimated Soil Excavation: 20,807 CY
Estimated Construction Time: 4 months

Alternative 3C

Similar to Alternative 3B, Alternative 3C would consider the land use of each individual redevelopment area. Existing concrete slabs would stay in place and engineering controls would be required to ensure any contamination under the slabs remained covered by the slabs. Except

for PCBs and arsenic, the PRGs would be based on Part 201 criteria. The PRGs for PCBs and arsenic would be based on OU7-specific risk-based calculations. Under Alternative 3C, the following PRGs would be used (see Table 6) to determine which soils need to be addressed and to estimate soil volumes:

- Part 201 Generic Residential Cleanup Criteria for all COCs except PCBs and arsenic would be applied to redevelopment areas with residential land use
- Part 201 Generic Non-Residential Cleanup Criteria for all COCs except PCBs and arsenic would be applied to redevelopment areas with non-residential land use
- Risk-based PRGs for PCBs would be applied as follows:
    - Redevelopment areas with residential land use, 2.5 mg/kg total PCBs
    - Redevelopment areas with non-residential land use, 9.1 mg/kg total PCBs
- Risk-based PRGs for arsenic would be applied as follows:
    - Redevelopment areas with residential land use, 6.4 mg/kg
    - Redevelopment areas with non-residential land use, 27 mg/kg
- PRGs for all COCs except arsenic would be met at all sampling locations throughout OU7
- The arsenic PRGs would be met using an iterative cleanup approach (as described earlier)

Alternative 3C Costs and Volumes
Estimated Capital Cost: $4,839,494
Estimated Annual O&M Cost: $2,400
Estimated Present Worth Cost: $4,875,232
Estimated Metals-Impacted Soils Left In Place Under Concrete Slabs: 185 CY
Estimated Soil Consolidated On OU7: N/A
Estimated Capping Material: N/A
Estimated Soil Excavation: 26,514 CY
Estimated Construction Time: 5 months

Alternative 3D
Similar to Alternative 3B, Alternative 3D would consider the land use of each individual redevelopment area. Existing concrete slabs would stay in place and engineering controls would be required to ensure any contamination under the slabs remained covered by the slabs. Except for PCBs and arsenic, the PRGs would be based on Part 201 criteria. The PRGs for PCBs would be based on TSCA Cleanup Level for Bulk PCB Remediation Waste in High Occupancy Areas and the PRG for arsenic would be based on state-wide background levels. Under Alternative 3D, the following PRGs would be used (see Table 6) to determine which soils need to be addressed and to estimate soil volumes:

- Part 201 Generic Residential Cleanup Criteria for all COCs except PCBs and arsenic would be applied to redevelopment areas with residential land use
- Part 201 Generic Non-Residential Cleanup Criteria for all COCs except PCBs and arsenic would be applied to redevelopment areas with non-residential land use
- TSCA Cleanup Level for Bulk PCB Remediation Waste in High Occupancy Areas (Without Further Conditions), 1 mg/kg total PCBs, would be applied to redevelopment areas with residential land use and to the Waterfront Plaza redevelopment area
- TSCA Cleanup Level for Bulk PCB Remediation Waste in High Occupancy Areas (With Further Conditions), 10 mg/kg total PCBs, would be applied to all other redevelopment

areas with non-residential land use; a cap would be required for areas where PCBs were left in place at concentrations between 1 mg/kg and 10 mg/kg, and deed restrictions requiring cap maintenance also would be required

- The arsenic PRG for all redevelopment areas would be the SDBL, 5.8 mg/kg
- PRGs for all COCs except arsenic would be met at all sampling locations throughout OU7
- The arsenic PRGs would be met using an iterative cleanup approach (as described earlier)

Alternative 3D Costs and Volumes
Estimated Capital Cost: $7,334,250
Estimated Annual O&M Cost: $9,600
Estimated Present Worth Cost: $7,477,202
Estimated Metals-Impacted Soils Left In Place Under Concrete Slabs: 800 CY
Estimated Soil Consolidated On OU7: N/A
Estimated Capping Material: N/A
Estimated Soil Excavation: 48,763 CY
Estimated Construction Time: 8 months

EVALUATION OF ALTERNATIVES

Explanation of the Nine Evaluation Criteria

EPA uses the following nine criteria, as required by Superfund law, to evaluate and compare cleanup alternatives. Each criterion is defined below, followed by a discussion of how each alternative meets or does not meet each criterion. The "Detailed Analysis of Alternatives" can be found in the FS. Table 9 provides a summary of this evaluation.

1. **Overall protection of human health and the environment:** Alternatives are evaluated to determine whether they can protect human health and the environment from unacceptable risks posed by hazardous substances, pollutants, or contaminants by eliminating, reducing, or controlling exposures.

2. **Compliance with ARARs:** Alternatives are evaluated to determine whether they attain requirements under federal, tribal, and state environmental laws and regulations, or provide grounds for invoking a waiver.

3. **Long-term effectiveness and permanence:** Alternatives are evaluated for the degree of long-term effectiveness and permanence they provide and for the degree of certainty that the alternative will prove to be successful.

4. **Reduction of toxicity, mobility, or volume through treatment:** Alternatives are evaluated to determine the degree to which they employ treatment to reduce toxicity, mobility, or volume, including how they use treatment to address hazardous substances.

5. **Short-term effectiveness:** Short-term impacts on the community and workers during implementation of alternatives are evaluated. These impacts include transportation

(including noise, dust, and traffic hazards), protection of workers, and the timeframe for implementing the remedy.

6. **Implementability:** The ease of implementing alternatives is evaluated, considering technical difficulties and reliability of a technology, coordination with other offices and agencies, and availability of services and materials.

7. **Cost:** Capital and O&M costs are evaluated.

8. **State Acceptance:** The State's position and key concerns on the preferred alternative and other alternatives are considered, as well as comments on ARARs or proposed use of waivers. This assessment is completed after comments on this Proposed Plan are received.

9. **Community Acceptance:** The community's support of, reservations about, or opposition to components of the alternatives are considered. This assessment is completed after comments on this Proposed Plan are received.

Comparison of Alternatives

1. Overall Protection of Human Health and the Environment

Alternative 1, the "No Action" alternative, does not provide adequate protection because it does not address the risks to human health and the environment identified in the BHHRA and the SLERA. The retained Alternative 2 and Alternative 3 Series alternatives – 2B, 2C, 3A, 3B, 3C, and 3D – would provide adequate protection of human health and the environment by eliminating, reducing, or controlling risk through excavation, cover, engineering controls and/or ICs.

Alternative 3A would not require the use of ICs because all contaminated soil above health-based limits would be excavated and shipped off site for disposal. In Alternatives 2B, 2C, 3B, 3C, and 3D, exposure to contaminated soils remaining on site would be mitigated by the cover systems. The cap system with liner and existing concrete slabs would serve as cover systems for Alternatives 2B and 2C. Existing concrete slabs would serve as cover systems in Alternatives 3B, 3C, and 3D, and the slabs would be covering a relatively small volume of contaminated material. The cover systems, in conjunction with the ICs, would prevent direct contact with the impacted soils.

Because the "No Action" alternative (Alternative 1) is not protective of human health and the environment, it will not be discussed further under the remaining eight criteria.

2. Compliance with ARARs

All retained action alternatives would meet the ARARs from federal and state laws. A list of the potential ARARs for OU7 is provided in Table 4. The major differences between the alternatives regarding compliance with ARARs are discussed below.

For compliance with the TSCA PCB cleanup standards at 40 CFR 761.61, Alternatives 2B, 2C, 3A, 3B, and 3C would not require a cap to be installed over the PCB concentrations remaining on site since the PRGs are either 1 mg/kg (Alternative 3A) or a risk-based value based on the appropriate residential or non-residential/commercial land use for each redevelopment area (Alternatives 2B, 2C, 3B, and 3C). Appropriate property use restrictions would be required for redevelopment areas with non-residential/commercial land use. Alternative 3D would include deed restrictions and require maintenance of a cap in any of the commercial redevelopment areas where soil PCB concentrations between 1 and 10 mg/kg would remain in place.

Alternatives 2B and 2C include relocation of soils at OU7. Handling of the impacted soil would require extra efforts to control fugitive dust from the stockpiled material. Alternative 3A would also include limited asbestos abatement activities prior to excavating within/beneath some of the buildings. None of the other alternatives include indoor excavation activities where asbestos emissions will need to be controlled and monitored.

Portions of the Main Mill building are registered on the National Register of Historic Places and any remedial action would need to comply with the National Historic Preservation Act (NHPA). All alternatives would be implemented to comply with the NHPA. Alternative 3A presents the most risk of damage to buildings due to the excavation of contaminated soils underlying existing concrete slabs at historic and non-historic buildings. Restoration activities for Alternative 3A would require the use of materials consistent with historic preservation of the structures affected and would therefore comply with NHPA.

3. Long-term Effectiveness and Permanence

The Alternative 3 Series options would result in a greater degree of long-term effectiveness and permanence than the Alternative 2 Series because, under the Alternative 3 Series, substantially more contaminated soils would be permanently removed from OU7 and substantially less contaminated soil would require on-site management. Alternative 3A would achieve the greatest degree of long-term effectiveness because all soils above health-based limits would be excavated and shipped off site for disposal. Alternatives 2B and 2C would rely on engineering controls and ICs to ensure long-term effectiveness, since contaminated soils would remain on site in a designated consolidation area and under existing concrete slabs. Alternatives 3B, 3C, and 3D also would rely on engineering controls and ICs for long-term effectiveness, since some contaminated soils would remain on site beneath existing concrete slabs, and under Alternative 3D some soils with PCB concentrations between 1 and 10 mg/kg would need to be managed under a cap.

Redevelopment of OU7 could modify the effectiveness of the engineering controls (concrete slabs) depending on the management of contaminated soils during and following redevelopment activities. Most of the impacted soils that would be left in place beneath concrete slabs, however, are under historical buildings not slated for demolition under current redevelopment plans.

The long-term effectiveness and permanence of Alternatives 2B and 2C is dependent on the effective design, operation, maintenance, and monitoring of the containment system and

compliance with ICs. Consolidation and capping are considered reliable technologies and offer long-term effectiveness at reducing the risk to human health and the environment. The amount of soil relocated, consolidated and capped on site varies between Alternatives 2B and 2C. Alternative 2B assumes 3,225 CY of soil would be capped on site and Alternative 2C assumes 5,050 CY of soil would be capped on site. The residual risk would be slightly greater for Alternative 2C, since more impacted soil would remain on site. Monitoring efforts would not vary between the two options since the volume of soil is not significantly different, and the consolidation/capped area would be in the same location under both alternatives.

ICs are prescribed under all action alternatives except for Alternative 3A. The purpose of the ICs under Alternatives 2B, 2C, 3B, 3C, and 3D is: (1) to prevent future potential human disturbances of the engineering controls; (2) to prohibit future residential use on the non-residential/ commercial areas; (3) to designate an area for use as a raised bed community garden for residential properties and prohibit gardens in other areas; and (4) to prohibit digging in areas not remediated to Part 201 Generic Residential Cleanup Criteria without proper training and protective measures. For Alternative 3D, the ICs would also serve to maintain and prevent disturbance of caps for areas with PCB contamination remaining in place at concentrations between 1 and 10 mg/kg.

The long-term effectiveness of the containment and/or engineering components of the various alternatives would be easily monitored. Evaluations of remedy performance would be included in periodic reports, the frequency and content of which would be established during remedial design. Where impacted material would remain on site (Alternatives 2B, 2C, 3B, 3C, and 3D), five-year reviews would be required to determine if the selected alternative is functioning as intended and continuing to provide adequate protection.

Considering all the information above, the remedial alternatives achieve long-term effectiveness and permanence in descending order as follows: 3A, 3D, 3C, 2C, 3B, and 2B.

4. Reduction of Toxicity, Mobility, or Volume through Treatment

None of the alternatives would use treatment to reduce the toxicity, mobility, or volume of contaminated media. The contaminated soils present on site are considered low-level threat wastes for which removal/off-site disposal and/or consolidation/capping on site are appropriate. Treatment of these soils is impracticable and not cost-effective.

5. Short-term Effectiveness

All of the alternatives pose some risks to cleanup workers or the community associated with the construction work (e.g., dust, noise, transportation, emissions associated with excavation of waste). These risks can be readily mitigated through use of personal protective equipment, dust control practices, restricted work hours, engineering controls, compliance with U.S. Department of Transportation regulations, and air monitoring. Risks to workers and the community can also be reduced by adherence to the "Superfund Green Remediation Strategy" and "Green Remediation: Best Management Practices for Excavation and Surface Restoration." Construction safety practices would be followed as recommended in the site-specific health and safety plan.

The duration of any short-term impacts would be less than one year for all of the alternatives (see estimated construction timeframes in the "Summary of Remedial Alternatives" section above).

The environmental impacts to OU7 in the short term would include uncovering additional impacted soils or sediments during remedial activities. Best management practices would be implemented including, but not limited to, silt fences, turbidity curtains, and dust control measures (using potable water). The alternatives assume that the majority of the soils targeted for off-site disposal would be direct-loaded into trucks and not staged on site. Excavation along the Mill Race would require the temporary divergence of part of the Mill Race (the methodology would be determined during the pre-design investigation). The turbidity of water in the Mill Race would be monitored during excavation activities adjacent to the river and/or Mill Race. Preparation of the consolidation area for the Alternative 2 Series options would require the excavation of previously-imported gravel material and temporary placement of this material on the Mill property. The temporarily staged gravel would be placed either on pavement or visqueen plastic sheeting and surrounded with silt fence, hay bales, or other erosion/sedimentation control methods to prevent sediment run off from entering the City stormwater system.

Alternatives 2B and 3B would have the shortest period of short-term impacts to workers and the community, as the estimated time to complete construction work under these alternatives is approximately 4 months. Alternative 2B would have more excavation work than Alternative 3B since the consolidation area would need to be constructed, and soils slated for consolidation would be handled twice. Alternative 3B would have more trucking/transportation of the excavated soils than Alternative 2B, since the soils would be shipped to an off-site disposal facility.

Similarly, Alternatives 2C and 3C would be completed in roughly the same amount of time, estimated at about 5 months. Alternative 2C would result in more exposure to on-site workers due to consolidation area construction and double-handling of contaminated soils, and Alternative 3C would require more off-site trucking.

Construction activities for Alternative 3D are anticipated to require approximately 8 months to complete. Alternative 3A would require the greatest construction period, estimated at 11 months, and would require the greatest amount of off-site disposal and associated short-term traffic impacts.

Short-term effectiveness of the alternatives decreases as more soil is excavated and as more soil cover materials must be brought on site. Greater amounts of off-site soil disposal will result in greater amounts of community disturbance related to transporting contaminated soil off site and greater potential for worker injury. Because of this, on-site disposal alternatives are more effective in the short term than the off-site disposal alternatives. Alternatives with soil covers present short-term effectiveness issues associated with transporting the fill and gravel on site and installing the covers.

6. Implementability

All of the alternatives can be readily implemented. Alternative 3A is the most complex due to the many excavation areas located under existing occupied and unoccupied buildings. Alternative 3D would be less complicated to implement than Alternative 3A because there would be no excavation under existing buildings; however, due to the low arsenic PRG, many of the excavations extend deeper than 10 feet bgs and would require significant shoring measures. Alternatives 3B and 3C would generally be equal to each other in terms of excavation and complexity, and would be the least complex of the Alternative 3 Series to implement. The excavation portion of the Alternative 2 Series would have the same complexity as Alternatives 3B and 3C, but overall the Alternative 2 Series would be more difficult to implement due to consolidation and capping on site. The manufactured materials needed for construction of a designated consolidation and capping area under the Alternative 2 Series are readily available.

7. Cost

The construction, O&M, and total present worth costs for each alternative are provided in the "Summary of Remedial Alternatives" section above. The total present worth costs for the OU7 action alternatives range from $4.36 million to $9.42 million. Alternative 3A is the most costly at $9.42 million, and Alternative 3B is the least costly at $4.36 million. The remaining alternatives range in cost from $4.46 million to $7.48 million. The remedial alternatives, listed in order of decreasing cost, are as follows: 3A ($9.42 million), 3D ($7.48 million), 2C ($5.00 million), 3C ($4.88 million), 2B ($4.46 million), and 3B ($4.36 million).

8. State/Support Agency Acceptance

The State of Michigan supports the preferred alternative, Alternative 3B.

9. Community Acceptance

Community acceptance of the preferred alternative will be evaluated after the public comment period ends and will be described in the ROD for OU7.

EPA's Preferred Alternative: Alternative 3B – Excavation and Off-Site Disposal

EPA is proposing Alternative 3B as the most appropriate cleanup alternative for OU7. The preferred remedy consists of:

- pre-design delineation and pre-excavation activities;
- excavation and off-site disposal of contaminated soil – except for contaminated soils underlying existing concrete slabs – with COC concentrations exceeding the following PRGs:
    - Part 201 Generic Residential Cleanup Criteria for all COCs except PCBs, for redevelopment areas with residential land use
    - Part 201 Generic Non-Residential Cleanup Criteria for all COCs except PCBs, for redevelopment areas with non-residential land use
    - The Part 201 arsenic PRGs would be met using an iterative cleanup approach

    - Risk-based PRGs for PCBs, as follows:
        - 2.5 mg/kg total PCBs for redevelopment areas with residential land use
        - 9.1 mg/kg total PCBs for redevelopment areas with non-residential land use;
- an estimated 95 CY of metals-contaminated soil would be left in place and safely contained beneath existing concrete slabs;
- removal and off-site disposal of a former coal tunnel and associated former fuel oil AST lines;
- backfill of excavation areas with clean fill;
- restoration, as appropriate; and
- institutional controls and engineering controls.

Figure 7 presents the conceptual area of materials impacted above the PRGs that would be addressed by Alternative 3B. In addition to materials present above the PRGs, the areas shown on the figure include materials anticipated to be remediated based on operational history and future redevelopment plans, including the coal tunnel, the former fuel oil AST lines from the former tank to the boiler house, and an area identified to be impacted during the installation of a storm sewer line by Michigan Department of Transportation.

In EPA's judgment, Alternative 3B provides the best balance of the evaluation criteria among the alternatives evaluated in the FS. Alternative 3B is protective of human health and the environment, meets all federal and state ARARs, and will achieve all of the RAOs.

Alternative 3B provides long-term and permanent protection against exposure to site-related contaminants by the combination of soil excavation, containment, and cover, coupled with appropriate institutional controls. Alternative 3B does not reduce the toxicity, mobility or volume of the contamination through treatment, however, effective alternative treatment technologies or resource recovery technologies are not practical for soil containing low levels of contamination. Alternative 3B provides short-term effectiveness when proper health and safety measures are taken. Alternative 3B is implementable. Finally, Alternative 3B meets the evaluation criteria at a lower cost than the other alternatives, and is therefore cost-effective.

Community Participation

EPA, in consultation with MDEQ, will evaluate public reaction to the preferred cleanup alternative during the public comment period before deciding on a final cleanup alternative. Based on new information or public comments, EPA may modify its preferred alternative or choose another. EPA encourages the public to review and comment on all of the cleanup alternatives.

EPA will respond in writing to all significant comments in a Responsiveness Summary which is part of the final decision document called the Record of Decision. EPA will announce the selected cleanup alternative in local newspaper advertisements and will place a copy of the ROD in the local information repositories.

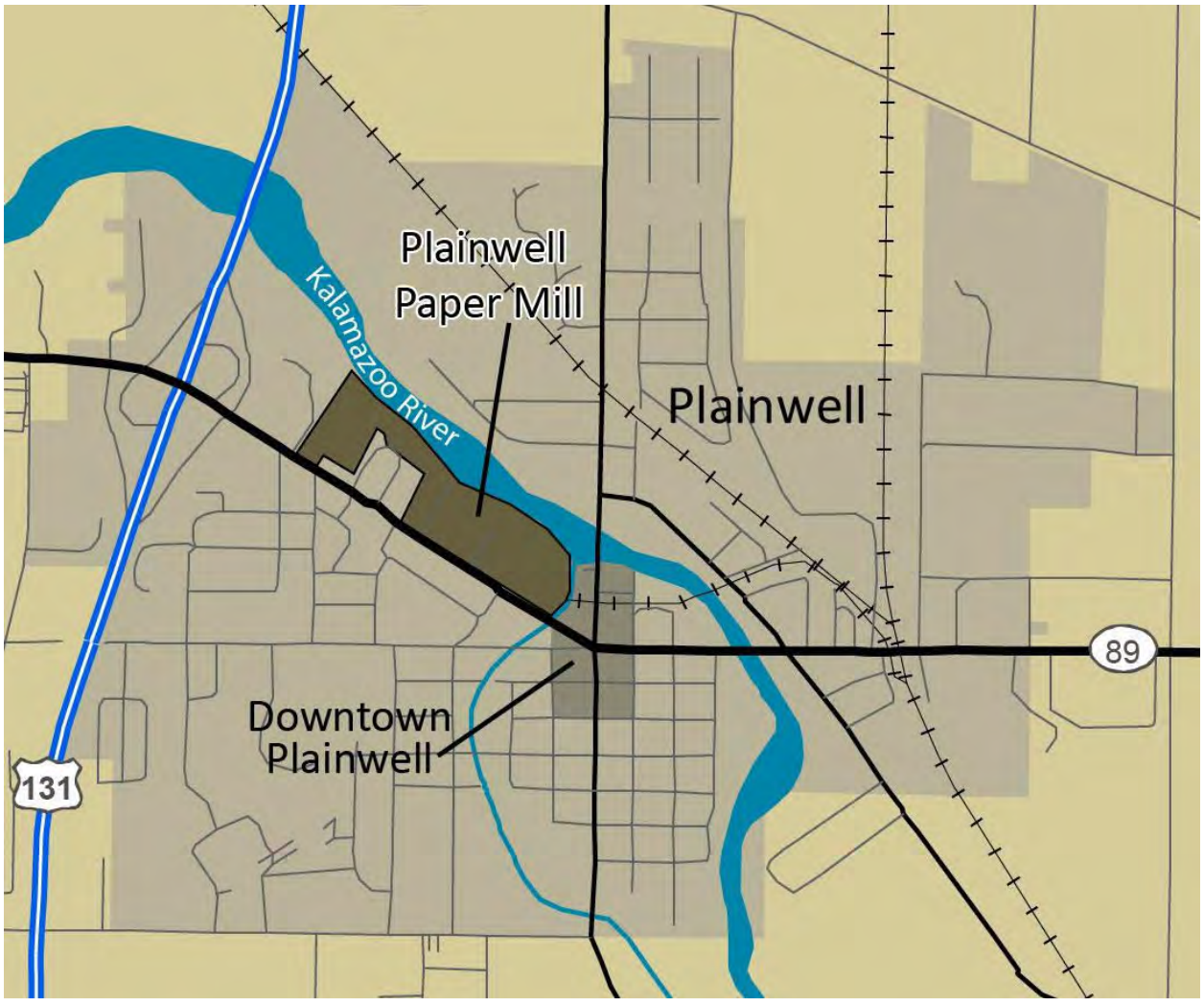
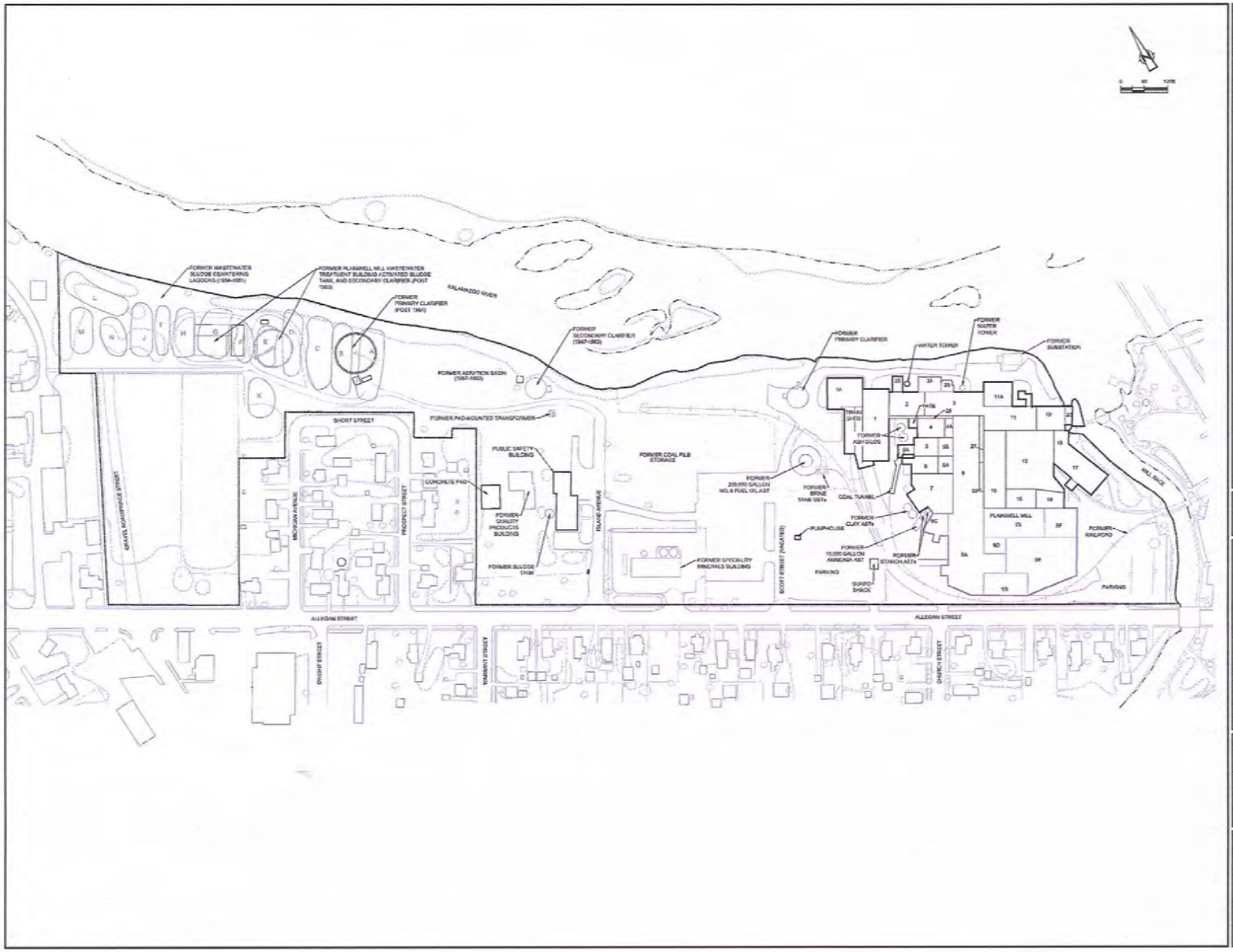


Figure 1: Plainwell Mill Site Location



NO	Revision	Date	ITEM

LEGEND

- SITE BOUNDARY (UP TO TOP OF BANK ALONG KALAMAZOO RIVER AND MILL RACE)
- AREA BOUNDARY
- FORMER FEATURE
- TREE LINE
- FENCE LINE
- RAILROAD
- SURFACE WATER

NOTE:

THE FORMER "SPECIALTY" MINERALS BUILDING AND FORMER SLUDGE TANK (ADJACENT TO THE FORMER SLUDGE DEWATERING BUILDING) WERE DEMOLISHED IN DECEMBER 2013. THE FORMER QUALITY PRODUCTS BUILDING WAS DEMOLISHED IN OCTOBER 2014. THE RAILROAD WAS REMOVED BY THE CITY OF PLAINWELL IN THE FALL OF 2014.

THE FOLLOWING STRUCTURES WERE DEMOLISHED ON BEHALF OF THE CITY OF PLAINWELL BETWEEN MARCH 6 AUGUST 20 12: BUILDING 3A, 9A, 9B, 9C, 9D, 9E, 9F, 23 AND 29, ONE 20,000-GALLON WATER TOWER, THE 200,000-GALLON RUAL CS. AST, THE BRINE TANKS, THE FORMER CLAY STARCH TANKS AND FORMER AMMONIA AST SECONDARY CONTAINMENT STRUCTURE.

THE FORMER WASTE WATER TREATMENT BUILDING, ASSOCIATED STRUCTURES AND BUILDING 25 WERE DEMOLISHED IN 2013.

SCALE VERIFICATION

THIS BAR MEASURES 1" ON ORIGINAL. ADJUST SCALE ACCORDINGLY.

ACDwSet

DRAWING STATUS

Status	Date	ITEM

FORMER PLAINWELL, INC. MILL PROPERTY PLAINWELL, MICHIGAN

FEASIBILITY STUDY REPORT

MILL PROPERTY LAYOUT

CONESTOGA-ROVERS & ASSOCIATES

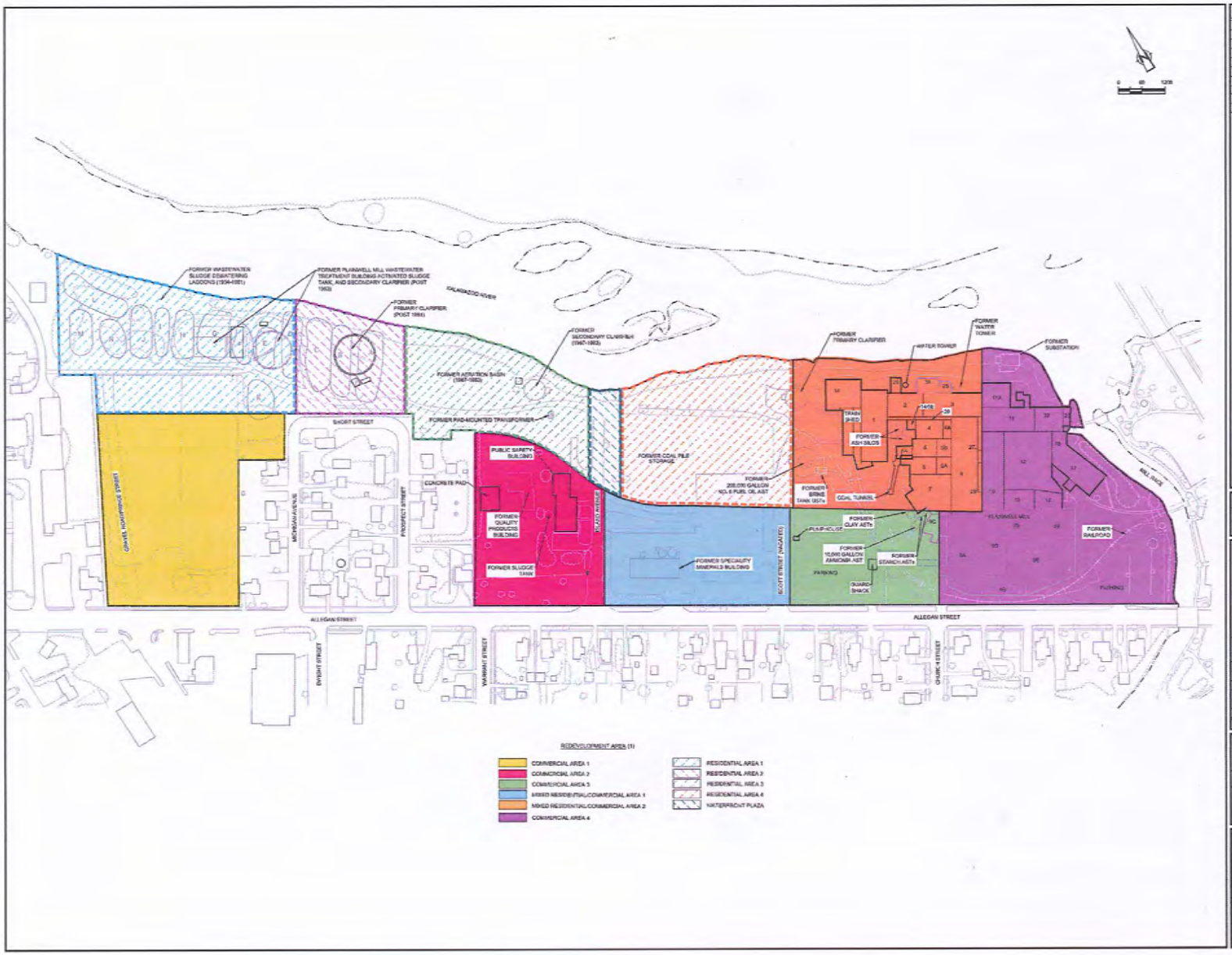
DrawCtb / RefereCtb:

REMEDIAL INVESTIGATION

Project Manager	Reviewed By	Date
J.D.	J.D.	AUGUST 2014
Scale: 1:120	Project No. 056394-07	Revision 009

Drawing No. figure 2

056394-07(009)GN-D009 AUG 4/2014



LEGEND

- SITE BOUNDARY (UP TO TOP OF BANK ALONG KALAMAZOO RIVER AND MILL RACE)
- FORMER FIXTURE
- TREE LINE
- FENCE LINE
- RAILROAD
- SURFACE WATER

NOTES:

THE FORMER SPECIALTY MINERALS BUILDING AND FORMER SLUDGE TANK (ADJACENT TO THE FORMER SLUDGE DEWATERING BUILDING) WERE DEMOLISHED IN DECEMBER 2011. THE FORMER QUALITY PRODUCTS BUILDING WAS DEMOLISHED IN OCTOBER 2011. THE RAILROAD WAS REMOVED BY THE CITY OF PLAINWELL IN THE FALL OF 2011.

THE FOLLOWING STRUCTURES WERE DEMOLISHED ON BEHALF OF THE CITY OF PLAINWELL BETWEEN MARCH 6 AUGUST 2012: BUILDING 3A, 9A, 9B, 9C, 9D, 9E, 9F, 23 AND 26, ONE 50,000-GALLON WATER TOWER, THE 205,000-GALLON FUEL OIL AST, THE BRINE TANKS, THE FORMER CLAY STARCH TANKS AND FORMER AMMONIA AST SECONDARY CONTAINMENT STRUCTURE.

THE FORMER WASTE WATER TREATMENT BUILDING, ASSOCIATED STRUCTURES AND BUILDING 25 WERE DEMOLISHED IN 2013.

(1) FOR REDEVELOPMENT AREAS ALONG THE KALAMAZOO RIVER AND MILL RACE, THEY ARE CONSIDERED TO EXTEND UP TO THE SITE BOUNDARY, WHICH IN THIS AREA IS DEFINED AS TOP OF BANK.

SCALE VERIFICATION

THIS BAR MEASURES 1" ON ORIGINAL. ADJUST SCALE ACCORDINGLY.

DRAWING STATUS

FORMER PLAINWELL, INC. MILL PROPERTY PLAINWELL, MICHIGAN

FEASIBILITY STUDY REPORT

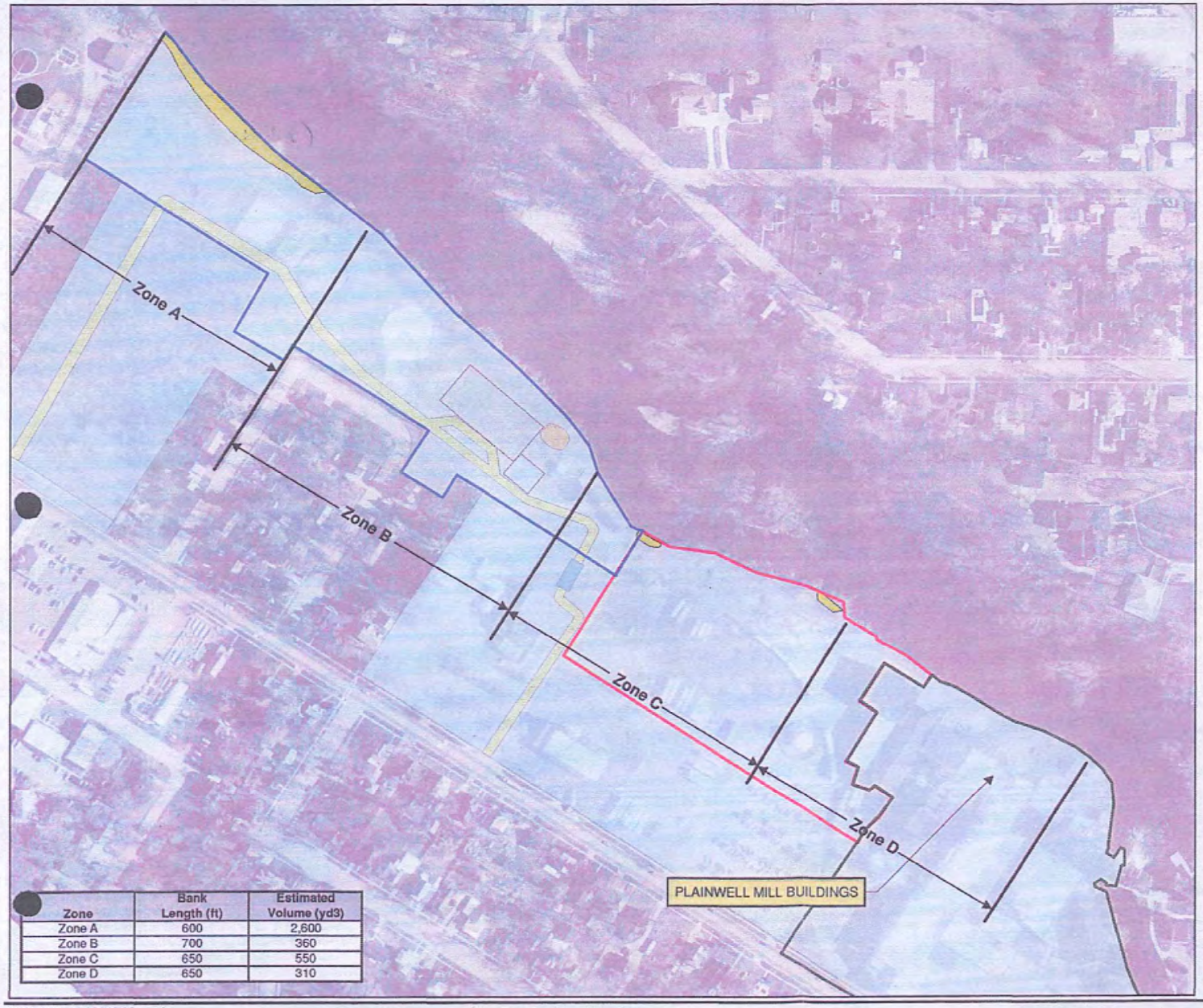
REDEVELOPMENT AREAS

CONESTOGA-ROVERS & ASSOCIATES

REMEDIAL INVESTIGATION

	JJD	AUGUST 2014
1:120	056394-07	009

figure 3



Zone	Bank Length (ft)	Estimated Volume (yd3)
Zone A	600	2,600
Zone B	700	360
Zone C	650	550
Zone D	650	310

LEGEND

- FORMER DEWATERING LAGOON AREA
- NORTHCENTRAL PORTION OF THE SITE
- PLAINWELL MILL BUILDINGS AREA
- PROPERTY LIMITS
- FLOODPLAIN AREAS

SEDIMENT AND WATER TREATMENT AREAS

- EXCESS MATERIAL STOCKPILE
- HAUL ROAD
- SEDIMENT DEWATERING AREA
- TRUCK WASH
- WASTE WATER TREATMENT AREA

0 200 400 Feet

1 inch = 200 feet

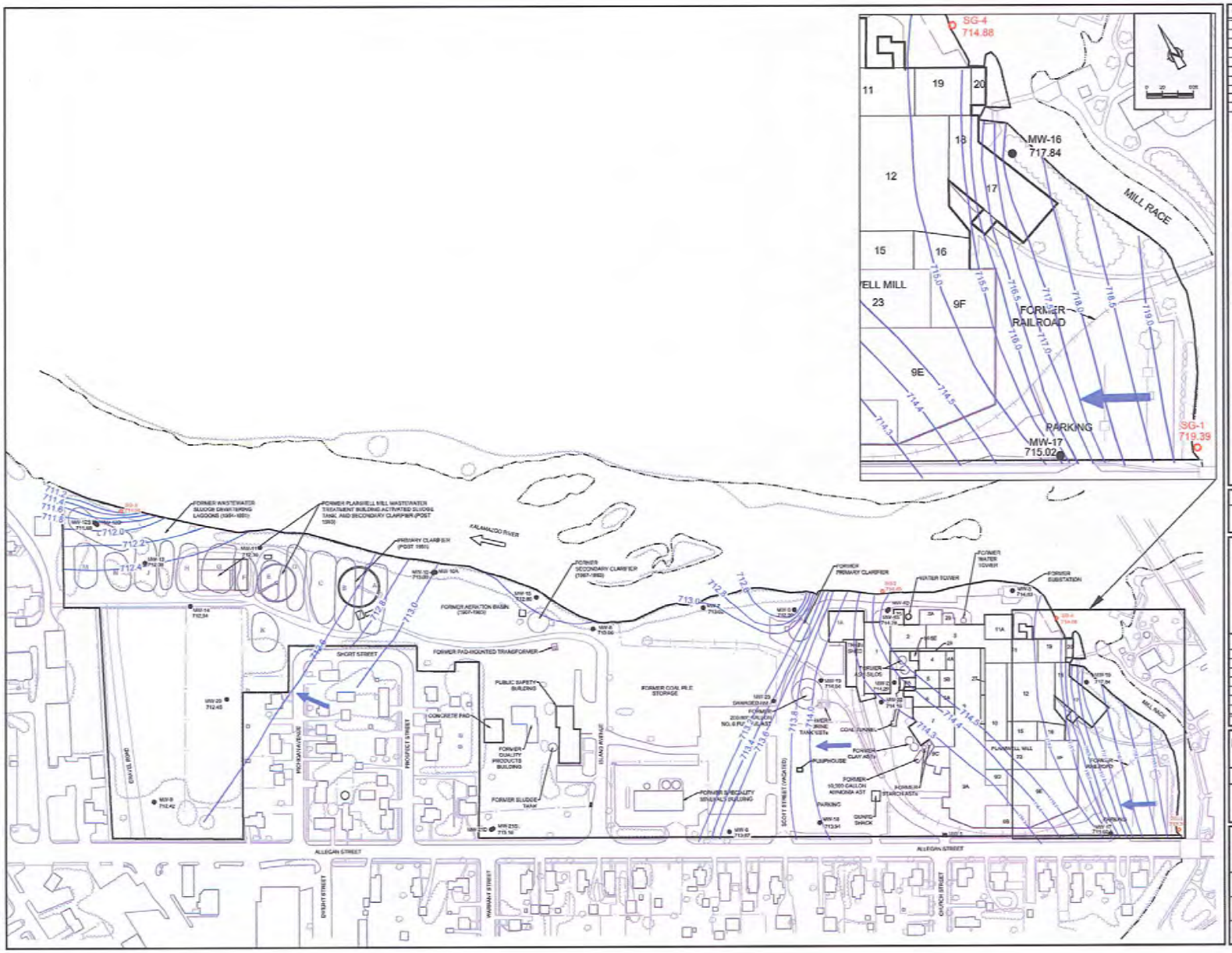
N W E S

PROJECT:
WEYERHAEUSER COMPANY
PLAINWELL MILL EMERGENCY ACTION

SHEET TITLE:
PROJECT SITE PLAN
PLAINWELL MILL PROPERTY AND RIVERBANK

DRAWN BY: PYLKASE	SCALE: AS NOTED	PROJ. NO.:	09-95130.0
CHECKED BY:		FILE NO.:	51300702.mx
APPROVED BY:	DATE PRINTED: 1/29/2009	FIGURE 4	
DATE: JANUARY 2009			

RMT
150 N. Patrick Blvd., Suite 180
Brookfield, WI 53045-5854
Phone: 262-879-1212
Fax: 262-879-1220



LEGEND

- PROPERTY BOUNDARY
- FORMER FEATURE
- TREE LINE
- FENCE LINE
- RAILROAD
- SURFACE WATER
- MW-6 MONITORING WELL LOCATION - PHASE I, II, AND ADDITIONAL RI
- SG-1 STAFF GAUGE - PHASE I RI AND ADDITIONAL RI
- MW-1 ABANDONED MONITORING WELL LOCATION
- MW-10 DESTROYED MONITORING WELL LOCATION
- 712.53 GROUNDWATER ELEVATION (4-11-05)
- 710.0 GROUNDWATER CONTOUR
- DIRECTION OF GROUNDWATER FLOW
- NM NOT MEASURED

NOTE:

THE FORMER SPECIALTY MINERALS BUILDING AND FORMER SLUDGE TANK (ADJACENT TO THE FORMER SLUDGE DEWATERING BUILDING) WERE DEMOLISHED IN DECEMBER 2011. THE FORMER QUALITY PRODUCTS BUILDING WAS DEMOLISHED IN OCTOBER 2011. THE RAILROAD WAS REMOVED BY THE CITY OF PLAINWELL IN THE FALL OF 2011.

THE FOLLOWING STRUCTURES WERE DEMOLISHED ON BEHALF OF THE CITY OF PLAINWELL BETWEEN MARCH & AUGUST 2012: BUILDINGS 3A, 9A, 9B, 9C, 9D, 9E, 9F, 23 AND 28, ONE 50,000-GALLON WATER TOWER, SIX 20,000-GALLON FUEL OIL ASTs, THE SPINE TANKS, THE FORMER CLAY STARCH TANKS AND FORMER AMMONIA AST SECONDARY CONTAINMENT STRUCTURE.

THE FORMER WASTE WATER TREATMENT BUILDING, ASSOCIATED STRUCTURES AND BUILDING 29 WERE DEMOLISHED IN 2013.

SCALE VERIFICATION

THIS BAR MEASURES 1" ON ORIGINAL. ADJUST SCALE ACCORDINGLY.

DRAWING STATUS

No.	Revision	Date	Initial

FORMER PLAINWELL, INC. MILL PROPERTY
PLAINWELL, MICHIGAN

GROUNDWATER CONTOUR MAP - APRIL 2014

CONESTOGA-ROVERS & ASSOCIATES

Project Manager	Reviewed By	Date
J.G.	B.E.	AUGUST 2014
Scale	Project No.	Rev. No.	Dwg. No.
1:120	056394-07	009	figure 5

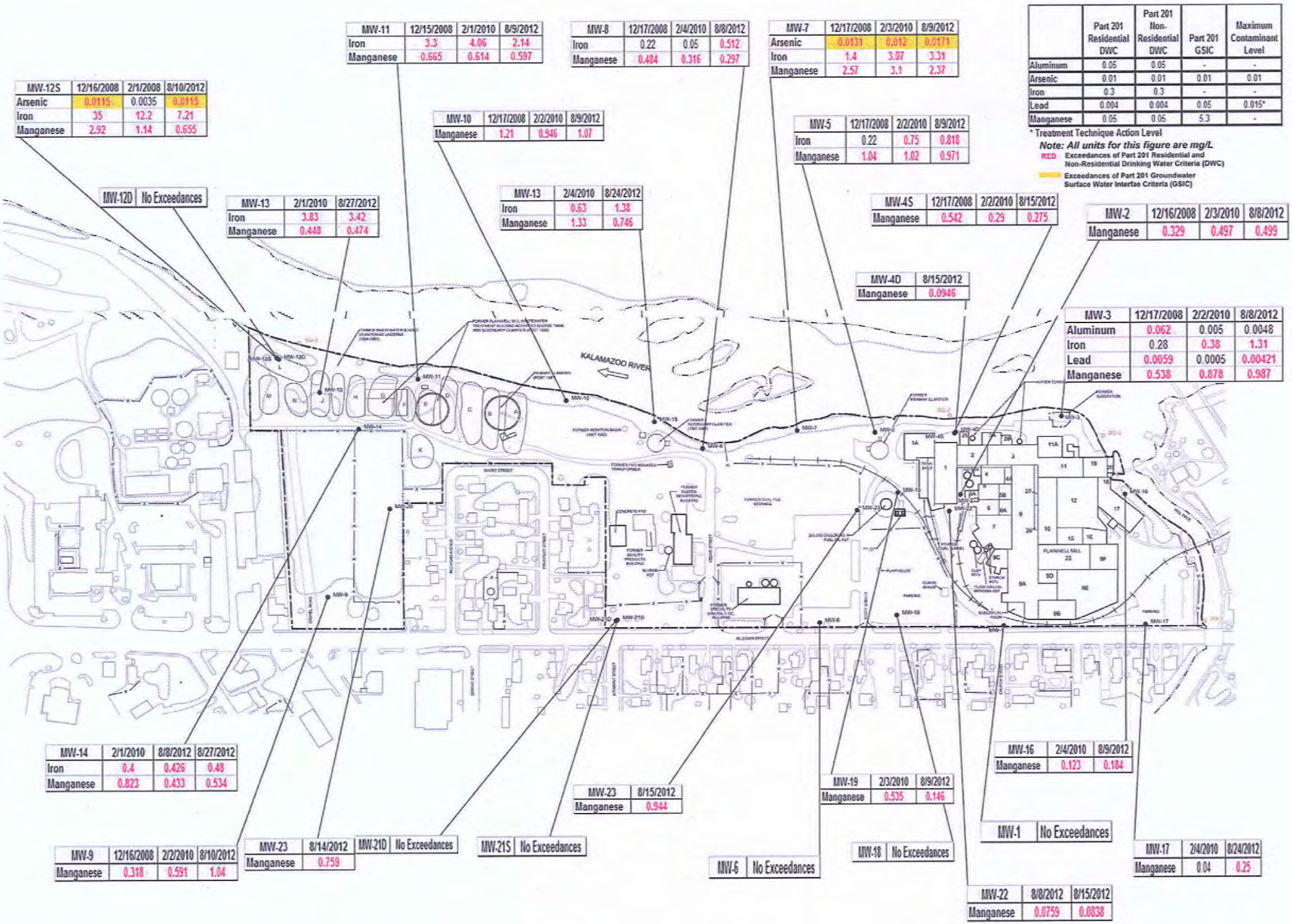
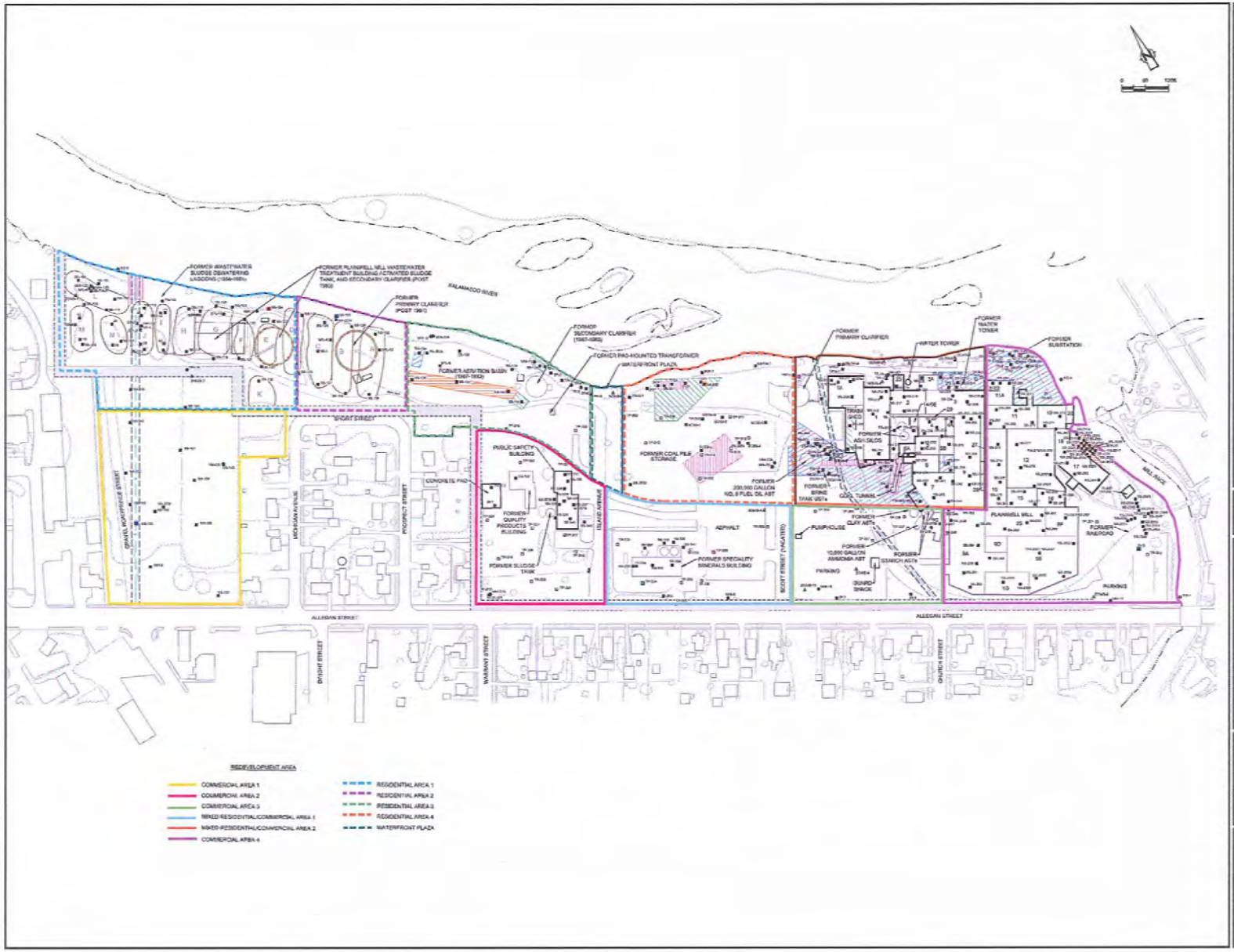


Figure 6: Michigan Part 201 Exceedances in Groundwater - Monitoring Wells



LEGEND

- SITE BOUNDARY (UP TO TOP OF BANK ALONG THE KALAMAZOO RIVER AND MILL RACE)
- TREE LINE
- FORMER FEATURES
- SURFACE WATER
- APPROXIMATE MICHIGAN GAS UTILITIES EASEMENT
- APPROXIMATE MDOT STORM SEWER EASEMENT BOUNDARY
- APPROXIMATE MDOT STORM SEWER LINE
- STAFF GAUGE LOCATION – PHASE I RI
- SOIL BORING LOCATION - PHASE II RI
- SOIL BORING LOCATION - ADDITIONAL RI ((MARCH & AUG. 2012)
- PREVIOUS SOIL SAMPLE LOCATION (FTC&H, 2008)
- PREVIOUS SOIL SAMPLE LOCATION (BSL, 1994)
- MONITORING WELL LOCATION – PHASE I, II & ADDITIONAL RI
- SURFACE SOIL SAMPLE LOCATION - PHASE II RI
- VERTICAL AQUIFER SAMPLE LOCATION - PHASE II RI
- PREVIOUS SOIL SAMPLE LOCATION (ERM, 1997)
- PREVIOUS GROUNDWATER SAMPLE LOCATION (ERM, 1997)
- ABANDONED MONITORING WELL LOCATION
- DESTROYED MONITORING WELL LOCATION

APPROXIMATE EXCAVATION DEPTHS (BGS)

- 0-2 feet
- 2-6 feet
- 6-10 feet
- >10 feet

NOTE:
1) ALTERNATIVES UTILIZE PART 201 LAND USE CRITERIA (EXCLUDING DWPC AND GSIPC) FOR ALL PARAMETERS EXCEPT FOR PCBs
2) ALTERNATIVES UTILIZE CALCULATED RISK-BASED CRITERIA OF 2.5 MG/KG FOR RESIDENTIAL AND MIXED AREAS, AND 9.1 MG/KG FOR COMMERCIAL AREAS FOR PCBs. SITE-SPECIFIC RISK-BASED VALUES DEVELOPED UNDER 40 CFR 761.61(c)
3) ITERATIVE APPROACH FOR ARSENIC REMEDIATION APPLIED TO EXCAVATION AREAS. THE ITERATIVE APPROACH IS DETAILED IN APPENDIX A
4) ALTERNATIVES ASSUME EXISTING CONCRETE SLABS FOR THE FOLLOWING BUILDING WILL REMAIN IN PLACE DURING AND AFTER REDEVELOPMENT: PUBLIC SAFETY BUILDING, BUILDINGS 1, 2, 3, 4, 4A, 5, 5B, 6, 7, 9, 9A, 9B, 9D, 9E, 9F, 10, 11, 11A, 12, 14/5E, 15, 15, 17, 18, 18, 20, 23, 26, 27, AND 29. SOIL WILL NOT BE EXCAVATED UNDER THESE CONCRETE SLABS

SCALE VERIFICATION

THIS BAR MEASURES 1" ON ORIGINAL. ADJUST SCALE ACCORDINGLY.

Approved

DRAWING STATUS

Status	Date	Initial

FORMER PLAINWELL, INC. MILL PROPERTY
PLAINWELL, MICHIGAN

FEASIBILITY STUDY REPORT

CONCEPTUAL EXCAVATION AREAS
ALTERNATIVES 2B AND 3B TO MEET
PART 201 LAND USE AND PCB RISK-BASED CRITERIA

CONESTOGA-ROVERS & ASSOCIATES

Source/Reference: REMEDIAL INVESTIGATION

Project Manager	Reviewed By	Date
J.D.	J.D.	JULY 2014

Scale	Project No.	Report/RT	Drawing No.
1:120	056394-07	009	figure 7

Table 1: Contaminants of Concern and Maximum Concentration of Exceedance of Potential PRGs in Soil

Contaminants of Concern (COC)	Residential Area 1 (mg/kg)	Residential Area 2 (mg/kg)	Residential Area 3 (mg/kg)	Residential Area 4 (mg/kg)	Waterfront Plaza (mg/kg)	Mixed Residential/ Commerical Area 1 (mg/kg)	Mixed Residential/ Commerical Area 2 (mg/kg)	Commercial Area 1 (mg/kg)	Commercial Area 2 (mg/kg)	Commercial Area 3 (mg/kg)	Commercial Area 4 (mg/kg)
Volatile Organic Compounds (VOCs)											
Benzene		0.21		3.4[a]			0.72			0.13	0.35
Ethylbenzene	0.43			4.3			3.1				
Methylene chloride	0.11		0.18				0.21		0.21	0.23	0.23
Tetrachloroethene	0.43						0.52				4.3
Toluene				25			13				
1,1,1-Trichloroethane											4.1
Trichloroethene						0.14	0.43				0.37
1,2,4-Trimethylbenzene							0.68				
Xylenes (total)	1.39			29			27	1.22		2.62	1.53
Semi-Volatile Organic Compounds (SVOCs)											
Benzo(a)anthracene							43[b]				
Benzo(a)pyrene				4.9[b]			33[b,c]				3.1[b]
Benzo(b)fluoranthene							39[b]				
Carbazole				3.2			9.2				
4-Chloro-3-methylphenol	0.38										
Dibenz(a,h)anthracene				6.4[b]			6.1[b]				
Dibenzofuran							4.4				
Fluoranthene				24			87				7.7
Fluorene							10				
Indeno(1,2,3-cd)pyrene							22[b]				
2-Methylnaphthalene							7.4				
4-Methylphenol	2.8										
Naphthalene	1.5			2.7			7.6				2.4
Pentachlorophenol	0.91	0.21		0.34			0.42				0.36
Phenanthrene	2.6		2.6	19			68				5.8
2,4,6-Trichlorophenol	0.36										
PCBs											
Total PCBs	**1.6**[h]	**2.38**[h]		37.9[b,c]			**1.5**[h]	**2.7**[g]			53[b,c]
Metals											
Aluminum	14500	8800	9010	17900		7980	16700	8460	9340	8460	15100
Antimony	16		9.4	47.2			54.5				13.7
Arsenic	92[b,c]	17.5[b]	26.4[b]	55.8[b,c]	**6.6**[f]	20[b]	804[b,c,d]	10.6[b]	46.9[b,c]	18[b]	75.4[b,c]
Barium				1030							
Cadmium											6.5
Chromium	24	33	60	102	23	44	66	22	20	25	75
Cobalt	8.7		11	14.4		29.6	38.1		7.2	9.7	23.8
Copper		184	139	870			2550				20000
Iron	15600000[b,c]	26200	33000	150000		38800	63200	14900	29700	16600	85200
Lead				2050[b,c]			2330[b,c]				771[b]
Magnesium	63800	81100	30100	73000	37400	100000	57600	22900	43100	26700	62400
Manganese	992	729	1440	1270		1880[e]	1100	1510[e]	1310	1200	3900[d,e]
Mercury	0.45	0.72	2.19	15.5		1.04	4.2	0.24	0.19	4.69	3.3
Selenium	2.6	0.8	2	4.5		2.1	33.3	1.2	1.4	2.6	2.4
Silver				3.4			1.8				10.9
Sodium											3270
Thallium							8.1				
Vanadium							72.1				
Zinc		415	455	1710			4600	789			1210
General Chemistry											
Cyanide (total)	2.8		2.3	2		1.2	2.5		2.4	2.2	2.4
Nitrite (as N)							349				
Phosphorus				6580			1920				3860

Note: Only COCs with exceedances of Part 201 criteria in soil are listed. Exceedances of DWPC and GSIPC are not bolded. Other exceedances of Part 201 criteria (red bold), as well as, exceedances of TSCA and RBCs (black bold) are noted.

[a] - Exceedance of Residential SVIAC

[b] - Exceedance of Residential DCC

[c] - Exceedance of Non-Residential DCC

[d] - Exceedance of Residential PSIC

[e] - Exceedance of Non-Residential PSIC

[f] - Exceedance of Residential RBC of arsenic at 10^{-5} and 10^{-6}

[g] - Exceedance of Residential RBC of PCBs at 10^{-5}

[h] - Exceedance of TSCA (without restrictions) of PCBs (1 mg/kg)

Table 1B: Contaminants of Concern and Maximum Concentration of Exceedance of Potential PRGs (except groundwater protection criteria) in Soil

Contaminants of Concern (COC)	Residential Area 1 (mg/kg)	Residential Area 2 (mg/kg)	Residential Area 3 (mg/kg)	Residential Area 4 (mg/kg)	Waterfront Plaza (mg/kg)	Mixed Residential/ Commerical Area 1 (mg/kg)	Mixed Residential/ Commerical Area 2 (mg/kg)	Commercial Area 1 (mg/kg)	Commercial Area 2 (mg/kg)	Commercial Area 3 (mg/kg)	Commercial Area 4 (mg/kg)
Benzene				**3.4**[a]							
Benzo(a)anthracene							**43**[b]				
Benzo(a)pyrene				**4.9**[b]			**33**[b,c]				**3.1**[b]
Benzo(b)fluoranthene							**39**[b]				
Dibenz(a,h)anthracene				**6.4**[b]			**6.1**[b]				
Indeno(1,2,3-cd)pyrene							**22**[b]				
Total PCBs	**1.6**[h]	**2.38**[h]		**37.9**[b,c]			**1.5**[h]	**2.7**[g]			**53**[b,c]
Arsenic	**92**[b,c]	**17.5**[b]	**26.4**[b]	**55.8**[b,c]	**6.6**[f]	**20**[b]	**804**[b,c,d]	**10.6**[b]	**46.9**[b,c]	**18**[b]	**75.4**[b,c]
Iron	**15600000**[b,c]										
Lead				**2050**[b,c]			**2330**[b,c]				**771**[b]
Manganese						**1880**[e]		**1510**[e]			**3900**[d,e]

Note: Only COCs with exceedances of Part 201 criteria in soil are listed. Exceedances of DWPC and GSIPC are not listed. Other exceedances of Part 201 criteria (red bold), as well as, exceedances of TSCA and RBCs (black bold) are noted.

[a] - Exceedance of Residential SVIAC

[b] - Exceedance of Residential DCC

[c] - Exceedance of Non-Residential DCC

[d] - Exceedance of Residential PSIC

[e] - Exceedance of Non-Residential PSIC

[f] - Exceedance of Residential RBC of arsenic at 10^{-5} and 10^{-6}

[g] - Exceedance of Residential RBC of PCBs at 10^{-5}

[h] - Exceedance of TSCA (without restrictions) of PCBs (1 mg/kg)

Table 2: Human Health Risk in Soil Greater Than EPA's Risk Range

Redevelopment Area	Medium	Receptor	Route	Cancer Risk	Hazard Index	Major Contributor(s)		
						COC	Risk	Hazard Quotient
Residential Area 1	Soil (disturbed)	Resident (Future)	Ingestion Dermal Inhalation	3.2E-05	1.5	Arsenic	3.1E-05	0.6
Residential Area 2	Soil (disturbed)	Resident (Future)	Ingestion Dermal Inhalation	2.3E-05	1.2	Arsenic	2.3E-05	0.4
						Iron	-	0.3
						Manganese	-	0.4
	Indoor Air (from soil)	Resident (Future)	Inhalation	1.5E-04	1.5	Benzene	1.5E-04	1.5
Residential Area 3	Soil (disturbed)	Resident (Future)	Ingestion Dermal Inhalation	3.3E-05	2.1	Arsenic	3.3E-05	0.6
Residential Area 4	Soil (disturbed)	Recreational User (Future)	Ingestion Dermal	2.4E-05	2.7	Total PCBs	8.3E-06	1.6
						Iron	-	0.7
	Soil (disturbed)	Resident (Future)	Ingestion Dermal Inhalation	1.2E-04	14.0	Benzo(a)pyrene	1.9E-05	-
						Dibenzo(a,h)anthracene	2.9E-05	-
						Arsenic	3.2E-05	0.6
						Iron	-	3.5
						Total PCBs	4.1E-05	8.1
	Soil (disturbed)	Commercial Worker (Future)	Ingestion Dermal	3.4E-05	1.4	Total PCBs	1.2E-05	0.9
						Cobalt	7.9E-06	0.3
	Soil (disturbed)	Construction Worker (Future)	Ingestion Dermal Inhalation	1.7E-06	2.0	Total PCBs	5.7E-07	1.0
						Iron	-	0.4
						Mercury	-	0.2
	Indoor Air (from soil)	Resident (Future)	Inhalation	2.7E-04	22.0	Mercury	-	18.0
						Benzene	2.4E-04	2.4
						Xylenes (total)	-	1.2
						Ethylbenzene	2.8E-05	0.0
	Indoor Air (from soil)	Commercial Worker (Future)	Inhalation	4.8E-05	4.8	Mercury	-	4.0
						Benzene	4.3E-05	0.5
Waterfront Plaza	*Not greater than EPA's risk range*							
Mixed Residential/ Commerical Area 1	Soil (disturbed)	Resident (Future)	Ingestion Dermal Inhalation	2.8E-05	1.7	Manganese	-	0.6
						Arsenic	2.8E-05	0.5
						Cobalt	-	0.3
						Iron	-	0.3
Mixed Residential/ Commerical Area 2	Soil (disturbed)	Recreational User (Future)	Ingestion Dermal	3.8E-05	1.1	Arsenic	2.5E-05	0.4
						Thalium	-	0.4
	Soil (disturbed)	Resident (Future)	Ingestion Dermal Inhalation	1.9E-04	5.3	Arsenic	1.2E-04	2.2
						Thalium		1.8
						Benzo(a)pyrene	4.2E-05	-
						Manganese	-	0.4
	Indoor Air (from soil)	Resident (Future)	Inhalation	4.5E-05	4.5	Mercury	-	3.1
						Xylenes (total)	-	0.6
						Tetrachloroethene	1.7E-06	0.4
						Benzene	3.5E-05	0.3
Commercial Area 1	*Not greater than EPA's risk range*							
Commercial Area 2	*Not greater than EPA's risk range*							
Commercial Area 3	Indoor Air (from soil)	Commercial Worker (Future)	Inhalation	3.9E-06	4.6	Mercury	-	4.5
Commercial Area 4	Soil (disturbed)	Recreational User (Future)	Ingestion Dermal Inhalation	1.2E-05	1.3	Total PCBs	4.6E-06	0.9
						Arsenic	7.1E-06	0.1

Table 3: Human Health Risk in Groundwater Greater Than EPA's Risk Range

Redevelopment Area	Medium	Receptor	Route	Cancer Risk	Hazard Index	Major Contributor(s)		
						COC	Risk	Hazard Quotient
Residential Area 1, Residential Area 2, Residential Area 3	Groundwater	Resident (Future)	Ingestion Dermal Inhalation	5.1E-04	15.0	Manganese	-	7.4
						Iron	-	2.0
						Arsenic	3.7E-04	3.6
						Chromium VI	1.3E-04	0.6
Residential Area 4, Mixed Residential/ Commerical Area 1	Groundwater	Resident (Future)	Ingestion Dermal Inhalation	3.3E-04	8.7	Arsenic	3.3E-04	3.2
						Manganese		5.4
Mixed Residential/ Commerical Area 2	Groundwater	Resident (Future)	Ingestion Dermal Inhalation	2.3E-04	36.0	Antimony	-	13.0
						Arsenic	2.0E-04	1.9
						Cadmium	-	11.0
						Iron	-	4.5
						Manganese	-	3.4
						Chromium VI	3.4E-05	0.2
						Selenium	-	0.9
Waterfront Plaza, Commercial Area 1, Commerical Area 2, Commercial Area 3, Commercial Area 4	*Not greater than EPA's risk range*							

TABLE 4

SUMMARY OF POTENTIAL APPLICABLE OR RELEVANT AND APPROPRIATE REQUIREMENTS (ARARs)
FEASIBILITY STUDY REPORT
FORMER PLAINWELL, INC. MILL PROPERTY
PLAINWELL, MICHIGAN

Regulation	*Citation*	*Description*	*ARAR/TBC*	*Comments*
FEDERAL				
Toxic Substances Control Act	40 CFR 761	Establishes storage, treatment and disposal requirements for PCB remediation wastes and for non-porous and porous surfaces contaminated with PCBs.	ARAR	Sampling and disposal requirements may be applicable to investigation-derived waste (IDW) and/or equipment evaluated
		Determines PCB cleanup level for soil using self-implementing, performance-based, or risk-based criteria; cleanup levels based on future land use.	ARAR	PCB cleanup levels for PCB remediation waste may be applicable 40 CFR 761.61(a)(8) requires deed restrictions requiring maintenance of caps for high occupancy areas with remaining contamination between 1-10 mg/kg. 40 CFR 761.61(a)(7) includes the cap requirements for high occupancy areas with contamination remaining between 1-10 mg/kg.
Clean Air Act	40 CFR 50 and 52	Establishes requirements for constituent emission rates in accordance with National Ambient Air Quality Standards.	ARAR	May be considered for remedial alternatives that include relocation of materials. State criteria may also apply.
	42 U.S.C. 7401 et seq.	Provides guidelines with respect to minimizing the harmful effects of fugitive dust and airborne contaminants that result from excavation, construction, and other removal activities. Establishes primary and secondary ambient air quality standards for emissions of chemicals and particulate matter.	ARAR	May be considered for remedial alternatives that include excavation/removal of residual/soil.
U.S. DOT Placarding and Handling	40 CFR 264.227 49 CFR 171	Transportation and handling requirements for materials containing PCBs with concentrations of 20 mg/kg or more.	ARAR	Applicable for the MW-16 area.
National Historic Preservation Act	16 USC 470, as amended	Establishes a program for the preservation of historical and archaeological sites. Created the National Register of Historic Places, list of National Historic Landmarks, and State Historic Preservation Offices.	ARAR	The Michigan Paper Company Historic District was listed in the National Register of Historic Places on September 8, 2011. Portions of the Site buildings have been designated as historical structures.
STATE				
Michigan Act 451, Part 201 - Environmental Remediation and Rules Promulgated Thereunder	MCL 324.20118(2) MCL 324.20120a MAC 299.5705	Requires that a remedial action shall provide for response activity that will satisfy cleanup criteria.	ARAR	The remedial action implemented must meet generic or Site-specific cleanup criteria.
	MCL 324.20120a MAC 299.5708	If the target detection limit or background concentration is greater than the risk-based cleanup criteria, the target detection limit or background concentration shall be used instead of the risk-based cleanup criterion.	ARAR	Applicable to all environmental media and may be used to gauge the success of the remedial action.
	MCL 324.2017a MCL 324.20114	Requirements for owner of a facility, such as preventing exacerbation and exercising due care.	ARAR	Applicable if materials are consolidated on-Site or if there is a release of materials above the PRGs from the Site.

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FEASIBILITY STUDY REPORT
FORMER PLAINWELL, INC. MILL PROPERTY
PLAINWELL, MICHIGAN

Regulation	*Citation*	*Description*	*ARAR/TBC*	*Comments*
STATE (CONTINUED)				
Michigan Act 451, Part 201 - Environmental Remediation and Rules Promulgated Thereunder	MCL 324.20120c MCL 324.20116 MCL 324.20120a(16) MCL 324.20120b MAC 299.5524	Requirements for relocation of excavated soil Restrictions on transfer of real property designated as a facility. Requirement that if residential criteria are not met, land use restrictions must be provided. Actions required upon approval of remedial action plans.	ARAR ARAR	Application for consolidation alternative Due to the presence of COCs above the Part 201 Residential Cleanup Criteria, property cannot be transferred without notification of land use restrictions that apply to the Site. All actions leaving COCs in place or cleanup that does not achieve unrestricted/residential use must include deed restrictions on activities that may interfere with the integrity of the remedial action and on activities that may result in unacceptable exposure.
	MCL 324.20118, et al. MAC 299.5532(11)	Required elements of remedial action plans (remedial design documents).	ARAR	Primary requirements can be met in remedial design documents by including plans identifying points of compliance for evaluating the effectiveness of the remedial action.
	MCL 324.20120c	Required action if contaminated soil is moved off-Site or relocated within the site.	ARAR	Material disposed off Site must be properly characterized to determine if it is subject to the requirements of Part 111 (Hazardous Waste Management). Required approval for soil relocation can be attained through MDEQ approval of a Remedial Design.
	MAC 299.5520 MAC 299.51003-51005	Objectives of response activities, determination (or nullification) that a response activity is complete.	ARAR	Upon completion of remedial actions, the PRP is required to demonstrate all requirements are achieved.
	MCL 324.20120a(4) MCL 324.20120b	Part 201 requires evaluation of the cumulative risk and the cumulative risk may not exceed a carcinogenic risk of 10^{-5} or a hazard index of 1.	ARAR	The cumulative risk at each site area may not exceed a carcinogenic risk of 10^{-5} or a hazard index of 1.
	MAC 299.5522 MAC 299.51017	Liable parties must provide notice to the department and adjacent land owners in certain situations, such as if hazardous substances emanate beyond the property boundary.	ARAR	Applicable if there is a release (above criteria) from the Site or if Generic Residential Cleanup Criteria are exceeded and contamination is believed to be migrating off-Site.
Michigan Act 451, Part 111 - Hazardous Waste Management and Rules Promulgated Thereunder	MCL 324.11101-11153 MAC 299.9101 -11107	Establishes requirements for hazardous waste generators, transporters, and treatment/storage/disposal facilites.	ARAR	Used for the characterization and identification of hazardous waste, and identification of appropriate treatment and disposal.
Michigan Act 451, Part 31 - Water Resources Protection and Rules Promulgated Thereunder	MCL 324.3109b	States that remedial actions that satisfy Part 201 satisfy this section.	ARAR	Applicable to remedial alternatives where Part 31 requirements are met.
Michigan Act 451, Part 91 - Soil Erosion and Sedimentation Control	MCL 324.9112 MCL 324.9116 MAC 323.1701-1714	Requirements for owners of land undergoing an earth change. Establishes rules prescribing soil erosion and sedimentation control plans, procedures, and measures.	ARAR	For any remedial action involving an earth change, liable parties must implement and maintain soil erosion and sedimentation control measures. Substantive requirements of permit must be satisfied.

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FEASIBILITY STUDY REPORT
FORMER PLAINWELL, INC. MILL PROPERTY
PLAINWELL, MICHIGAN

Regulation	*Citation*	*Description*	*ARAR/TBC*	*Comments*
STATE (CONTINUED)				
Michigan Act 451, Part 55 - Air Pollution Control and Rules Promulgated Thereunder	MAC 336.1101-2706	Establishes rules prohibiting the emission of air contaminants in quantities which cause injurious effects to human health, animal life, plant life or significant economic value, and/or property.	ARAR	Applicable for remedial alternatives that would generate air emissions (e.g., dust during excavation, soil stabilization, or compaction). For certain remedial alternatives, air emissions must comply with substantive requirements of permits and monitoring would be required.
Michigan Public Act 300 of 1949, as amended. Michigan Vehicle Code	MCL 257.716, 257.722, et seq MAC 257.101, et seq	Rules governing the reduction of maximum axle loads during springtime frost periods.	ARAR	Remedial action and construction may require heavy loads of equipment, fill dirt, PCB- containing media, etc. to be transported over roadways; however, this is not allowed during frost periods.
Michigan Public Act 306 of 1969, as amended – Well Construction Code	MCL 24.233, 24.263, and 333.12714	Establishes rules for well installation and abandonment.	ARAR	Applicable to wells that are abandoned or wells that may be installed as part of groundwater monitoring activities.
Michigan Act 451, Part 115 - Solid Waste Management and Rules Promulgated Thereunder	MCL 324.11501-11504 MCL 324.11507 MCL 324.11540 MAC 299.4101-4106a MAC 299.4301 (3)(d)	Establishes rules for methods of solid waste disposal and for design/operational standards for disposal areas.	ARAR	May apply for on-Site remedial actions that rely on solid waste to remain on-Site.
	MAC 299.4305 MAC 299.4307 MAC 299.4308	Landfill location restrictions and liner design standards.	ARAR	Not applicable because the Site is not a new disposal area. However, location restrictions and liner design standards may be considered for alternatives that include on-Site consolidation.
	MAC 299.4306	Water quality performance standards.	ARAR	The cap design must ensure that all requirements for the protection of surface and groundwater under Part 31 (and rules) are met. A design that keeps the final cover from being inundated is capable of limiting erosion and infiltration to the extent necessary to protect human health and the environment.
	MAC 299.4912	Requirements for natural soil barriers.	ARAR	Natural soil barriers (or augments) may be evaluated by the specifications in this rule to help determine if the barriers are adequate to prevent lateral flow of groundwater into and out of the waste.
	MAC 299.4913 MAC 299.4915	Requirements for final cover materials.	ARAR	Covers must meet the specifications in the rules.
	MAC 299.4916-4921	Construction Quality Control Program	ARAR	Substantive portions of construction quality control must be met in Remedial Design and Remedial Action.

SUMMARY OF POTENTIAL APPLICABLE OR RELEVANT AND APPROPRIATE REQUIREMENTS (ARARs)
FEASIBILITY STUDY REPORT
FORMER PLAINWELL, INC. MILL PROPERTY
PLAINWELL, MICHIGAN

Regulation	*Citation*	*Description*	*ARAR/TBC*	*Comments*
LOCAL				
Public Safety - Excavations	Chapter 9-3 - Plainwell Code of City Ordinances	Requires that any open excavation be surrounded by fencing to protect the public.	ARAR	Any remedial action involving excavations will require implementation of proper engineering controls to protect the public.
Soil Erosion and Sedimentation Control	Allegan County Ordinance No. 1013.1	Control soil erosion and sedimentation with respect to earth change activities within the County.	ARAR	For any remedial action involving an earth change, liable parties must implement and maintain soil erosion and sedimentation control measures. Substantive requirements of permit must be satisfied.

Table 5: List of Michigan Part 201 Generic Cleanup Criteria[1] For COCs in Soil

			Groundwater Protection			***Indoor Air***		***Ambient Air***	
		Statewide Default Background Level	Residential Drinking Water Protection	Nonresidential Drinking Water Protection	Groundwater Surface Water Interface Protection [4]	Residential Soil Volatilization to Indoor Air Inhalation	Nonresidential Soil Volatilization to Indoor Air Inhalation	Residential Infinite Source Volatile Soil Inhalation	Nonresidential Infinite Source Volatile Soil Inhalation
	Units								
Volatile Organic Compounds (VOCs)									
Benzene	mg/kg	-	0.1	0.1	4	1.6	8.4	13	45
Ethylbenzene	mg/kg	-	1.5	1.5	0.36	87	460	720	2400
Methylene chloride	mg/kg	-	0.1	0.1	30	45	240	210	700
Tetrachloroethene	mg/kg	-	0.1	0.1	1.2	11	21	170	210
Toluene	mg/kg	-	16	16	5.4	330	610	2800	3300
1,1,1-Trichloroethane	mg/kg	-	4	4	1.8	250	460	3800	4500
Trichloroethene	mg/kg	-	0.1	0.1	4	1.0	1.9	11	14
1,2,4-Trimethylbenzene	mg/kg	-	2,100	2100	570	4300000	8000000	21000000	25000000
Xylenes (total)	mg/kg	-	5.6	5.6	0.82	6300	12000	46000	54000
Semi-Volatile Organic Compounds (SVOCs)									
Benzo(a)anthracene	mg/kg	-	NLL	NLL	NLL	NLV	NLV	NLV	NLV
Benzo(a)pyrene	mg/kg	-	NLL	NLL	NLL	NLV	NLV	NLV	NLV
Benzo(b)fluoranthene	mg/kg	-	NLL	NLL	NLL	ID	ID	ID	ID
Carbazole	mg/kg	-	9.4	39	1.1	NLV	NLV	NLV	NLV
4-Chloro-3-methylphenol	mg/kg	-	5.8	16	0.28	NLV	NLV	NLV	NLV
Dibenz(a,h)anthracene	mg/kg	-	NLL	NLL	NLL	NLV	NLV	NLV	NLV
Dibenzofuran	mg/kg	-	ID	ID	1.7	2000	3600	130	160
Fluoranthene	mg/kg	-	730	730	5.5	1000000	1000000	740000	890000
Fluorene	mg/kg	-	390	890	5.3	580000	1000000	130000	150000
Indeno(1,2,3-cd)pyrene	mg/kg	-	NLL	NLL	NLL	NLV	NLV	NLV	NLV
2-Methylnaphthalene	mg/kg	-	57	170	4.2	2700	4900	1500	1800
4-Methylphenol	mg/kg	-	7.4	20	1	NLV	NLV	NLV	NLV
Naphthalene	mg/kg	-	35	100	0.73	250	470	300	350
Pentachlorophenol	mg/kg	-	0.022	0.022	26.5	NLV	NLV	NLV	NLV
Phenanthrene	mg/kg	-	56	160	2.1	2800	5100	160	190
2,4,6-Trichlorophenol	mg/kg	-	2.4	9.4	0.33	NLV	NLV	NLV	NLV
Polychlorinated Biphenyls (PCBs) [3]									
Total PCBs	mg/kg	-	NLL	NLL	NLL	3000	16000	240	810

Table 5: List of Michigan Part 201 Generic Cleanup Criteria[(1)] For COCs in Soil

			Groundwater Protection			***Indoor Air***		***Ambient Air***	
		Statewide Default Background Level	Residential Drinking Water Protection	Nonresidential Drinking Water Protection	Groundwater Surface Water Interface Protection [(2)]	Residential Soil Volatilization to Indoor Air Inhalation	Nonresidential Soil Volatilization to Indoor Air Inhalation	Residential Infinite Source Volatile Soil Inhalation	Nonresidential Infinite Source Volatile Soil Inhalation
	Units								
Metals									
Aluminum	mg/kg	6900	1	1	-	NLV	NLV	NLV	NLV
Antimony	mg/kg	-	4.3	4.3	94	NLV	NLV	NLV	NLV
Arsenic	mg/kg	5.8	4.6	4.6	4.6	NLV	NLV	NLV	NLV
Barium	mg/kg	75	1300	1300	950	NLV	NLV	NLV	NLV
Cadmium	mg/kg	1.2	6	6	6.15	NLV	NLV	NLV	NLV
Chromium	mg/kg	18	1000000	1000000	3.3	NLV	NLV	NLV	NLV
Cobalt	mg/kg	6.8	0.8	2	2	NLV	NLV	NLV	NLV
Copper	mg/kg	32	5800	5800	135	NLV	NLV	NLV	NLV
Iron	mg/kg	12000	6	6	-	NLV	NLV	NLV	NLV
Lead	mg/kg	21	700	700	8780	NLV	NLV	NLV	NLV
Magnesium	mg/kg	-	8000	22000	-	NLV	NLV	NLV	NLV
Manganese	mg/kg	440	1	1	105	NLV	NLV	NLV	NLV
Mercury	mg/kg	0.13	1.7	1.7	0.05	48	89	52	62
Selenium	mg/kg	0.41	4	4	0.4	NLV	NLV	NLV	NLV
Silver	mg/kg	1	4.5	13	0.1	NLV	NLV	NLV	NLV
Sodium	mg/kg	-	4600	7000	-	NLV	NLV	NLV	NLV
Thallium	mg/kg	-	2.3	2.3	4.2	NLV	NLV	NLV	NLV
Vanadium	mg/kg	-	72	990	430	NLV	NLV	NLV	NLV
Zinc	mg/kg	47	2400	5000	303	NLV	NLV	NLV	NLV
General Chemistry									
Cyanide (total)	%	0.39	4	4	0.1	NLV	NLV	NLV	NLV
Cyanide (total)	mg/kg	0.39	4	4	0.1	NLV	NLV	NLV	NLV
Nitrate (as N)	mg/kg	-	200	200	ID	NLV	NLV	NLV	NLV
Phosphorus	mg/kg	-	1300	4800	EE	NLV	NLV	NLV	NLV

Notes:

-- No criterion promulgated under Part 201

NLV - Hazardous substance is not likely to volatilize under most conditions.

ID - Insufficient data to develop criterion

NLL - Hazardous substance is not likely to leach under most soil conditions.

mg/kg - milligrams per kilogram

[(1)] MDEQ (Michigan) Generic soil cleanup criteria for residential and nonresidential category, administrative rule R 299.48 effective

[(2)] Carbonate Hardness of 307 mg/L and pH of 7.97 were used to calculate site-specific GSI Protection Criteria, as applicable.

[(3)] Footnote T, Footnotes for Generic Cleanup Criteria Tables, administrative rule R 299.49, effective December 30, 2013, refers the reader to TSCA for the determination of the applicability of TSCA, which is incorporated by reference into the Part 201 rules. Footnote T provides for alternatives to compliance with the TSCA requirements if TSCA cleanup levels are not applicable. See Table 2.3 for TSCA cleanup levels.

Table 5: List of Michigan Part 201 Generic Cleanup Criteria[(1)] For COCs in Soil

				Ambient Air				***Contact***		***Csat***
		Residential Finite VSIC for 5 Meter Source Thickness	Nonresidential Finite VSIC for 5 Meter Source Thickness	Residential Finite VSIC for 2 Meter Source Thickness	Nonresidential Finite VSIC for 2 Meter Source Thickness	Residential Particulate Soil Inhalation	Nonresidential Particulate Soil Inhalation	Residential Direct Contact	Nonresidential Direct Contact	Soil Saturation Concentration Screening Levels
	Units									
Volatile Organic Compounds (VOCs)										
Benzene	mg/kg	34	99	79	230	380000	470000	180	840	400
Ethylbenzene	mg/kg	1000	3100	2200	6500	10000000	13000000	22000	71000	140
Methylene chloride	mg/kg	590	1700	1400	4000	6600000	8300000	1300	5800	2300
Tetrachloroethene	mg/kg	480	490	1100	1100	2700000	1200000	200	930	88
Toluene	mg/kg	5100	36000	12000	36000	27000000	12000000	50000	160000	250
1,1,1-Trichloroethane	mg/kg	12000	15000	28000	31000	67000000	29000000	500000	1000000	460
Trichloroethene	mg/kg	25	25	57	58	130000	59000	110	660	500
1,2,4-Trimethylbenzene	mg/kg	500000000	600000000	500000000	600000000	82000000000	36000000000	32000000	100000000	110000
Xylenes (total)	mg/kg	61000	65000	130000	130000	290000000	130000000	410000	1000000	150
Semi-Volatile Organic Compounds (SVOCs)										
Benzo(a)anthracene	mg/kg	NLV	NLV	NLV	NLV	ID	ID	20	80	-
Benzo(a)pyrene	mg/kg	NLV	NLV	NLV	NLV	1500	1900	2	8	-
Benzo(b)fluoranthene	mg/kg	ID	ID	ID	ID	ID	ID	20	80	-
Carbazole	mg/kg	NLV	NLV	NLV	NLV	62000	78000	530	2400	-
4-Chloro-3-methylphenol	mg/kg	NLV	NLV	NLV	NLV	ID	ID	4500	15000	-
Dibenz(a,h)anthracene	mg/kg	NLV	NLV	NLV	NLV	ID	ID	2	8	-
Dibenzofuran	mg/kg	130	160	130	160	6700	2900	ID	ID	-
Fluoranthene	mg/kg	740000	880000	740000	880000	9300000	4100000	46000	130000	-
Fluorene	mg/kg	130000	150000	130000	150000	9300000	4100000	27000	87000	-
Indeno(1,2,3-cd)pyrene	mg/kg	NLV	NLV	NLV	NLV	ID	ID	20	80	-
2-Methylnaphthalene	mg/kg	1500	1800	1500	1800	670000	290000	8100	26000	-
4-Methylphenol	mg/kg	NLV	NLV	NLV	NLV	6700000	2900000	11000	36000	-
Naphthalene	mg/kg	300	350	300	350	200000	88000	16000	52000	-
Pentachlorophenol	mg/kg	NLV	NLV	NLV	NLV	100000	130000	90	320	-
Phenanthrene	mg/kg	160	190	160	190	6700	2900	1600	5200	-
2,4,6-Trichlorophenol	mg/kg	NLV	NLV	NLV	NLV	1000000	1300000	710	3300	-
Polychlorinated Biphenyls (PCBs) [(3)]										
Total PCBs	mg/kg	7900	28000	7900	28000	5200	6500	4	16	-

Table 5: List of Michigan Part 201 Generic Cleanup Criteria[(1)] For COCs in Soil

				Ambient Air				***Contact***		***Csat***
		Residential Finite VSIC for 5 Meter Source Thickness	Nonresidential Finite VSIC for 5 Meter Source Thickness	Residential Finite VSIC for 2 Meter Source Thickness	Nonresidential Finite VSIC for 2 Meter Source Thickness	Residential Particulate Soil Inhalation	Nonresidential Particulate Soil Inhalation	Residential Direct Contact	Nonresidential Direct Contact	Soil Saturation Concentration Screening Levels
	Units									
Metals										
Aluminum	mg/kg	NLV	NLV	NLV	NLV	ID	ID	50000	370000	-
Antimony	mg/kg	NLV	NLV	NLV	NLV	13000	5900	180	670	-
Arsenic	mg/kg	NLV	NLV	NLV	NLV	720	910	7.6	37	-
Barium	mg/kg	NLV	NLV	NLV	NLV	330000	150000	37000	130000	-
Cadmium	mg/kg	NLV	NLV	NLV	NLV	1700	2200	550	2100	-
Chromium	mg/kg	NLV	NLV	NLV	NLV	330000	150000	790000	1000000	-
Cobalt	mg/kg	NLV	NLV	NLV	NLV	13000	5900	2600	9000	-
Copper	mg/kg	NLV	NLV	NLV	NLV	130000	59000	20000	73000	-
Iron	mg/kg	NLV	NLV	NLV	NLV	ID	ID	160000	580000	-
Lead	mg/kg	NLV	NLV	NLV	NLV	100000	44000	400	900	-
Magnesium	mg/kg	NLV	NLV	NLV	NLV	6700000	2900000	1000000	1000000	-
Manganese	mg/kg	NLV	NLV	NLV	NLV	3300	1500	25000	90000	-
Mercury	mg/kg	52	62	52	62	20000	8800	160	580	-
Selenium	mg/kg	NLV	NLV	NLV	NLV	130000	59000	2600	9600	-
Silver	mg/kg	NLV	NLV	NLV	NLV	6700	2900	2500	9000	-
Sodium	mg/kg	NLV	NLV	NLV	NLV	ID	ID	1000000	1000000	-
Thallium	mg/kg	NLV	NLV	NLV	NLV	13000	5900	35	130	-
Vanadium	mg/kg	NLV	NLV	NLV	NLV	ID	ID	750	5500	-
Zinc	mg/kg	NLV	NLV	NLV	NLV	ID	ID	170000	630000	-
General Chemistry										
Cyanide (total)	%	NLV	NLV	NLV	NLV	250	250	12	250	-
Cyanide (total)	mg/kg	NLV	NLV	NLV	NLV	250	250	12	250	-
Nitrate (as N)	mg/kg	NLV	NLV	NLV	NLV	ID	ID	ID	ID	-
Phosphorus	mg/kg	NLV	NLV	NLV	NLV	67000	29000	1000000	1000000	-

Notes:

-- No criterion promulgated under Part 201

NLV - Hazardous substance is not likely to volatilize under most conditions.

ID - Insufficient data to develop criterion

NLL - Hazardous substance is not likely to leach under most soil conditions.

mg/kg - milligrams per kilogram

[(1)] MDEQ (Michigan) Generic soil cleanup criteria for residential and nonresidential category, administrative rule R 299.48 effective

[(2)] Carbonate Hardness of 307 mg/L and pH of 7.97 were used to calculate site-specific GSI Protection Criteria, as applicable.

[(3)] Footnote T, Footnotes for Generic Cleanup Criteria Tables, administrative rule R 299.49, effective December 30, 2013, refers the reader to TSCA for the determination of the applicabilit of TSCA, which is incorporated by reference into the Part 201 rules. Footnote T provides for alternatives to compliance with the TSCA requirements if TSCA cleanup levels are not applicable. See Table 2.3 for TSCA cleanup levels.

Table 6: Comparison of Preliminary Remediation Goals for Soil by Alternative for Each Redevelopment Area

Redevelopment Area	Land Use Designation	Soil Remedial Alternatives 2A and 3A	Soil Remedial Alternatives 2B and 3B	Soil Remedial Alternatives 2C and 3C	Soil Remedial Alternatives 2D and 3D
Residential Area 1, Residential Area 2, Residential Area 3, Residential Area 4, Mixed Residential/Commercial Area 1, Mixed Residential/Commercial Area 2	Residential	Part 201 Generic Residential Cleanup Criteria [1, 2, 3]	Part 201 Generic Residential Cleanup Criteria [1, 2, 3]	Part 201 Generic Residential Cleanup Criteria [1, 3, 7]	Part 201 Generic Residential Cleanup Criteria [1, 3, 7]
		1 mg/kg for PCBs [4]	2.5 mg/kg for PCBs [5]	2.5 mg/kg for PCBs [5]	1 mg/kg for PCBs [4, 12]
				6.4 mg/kg for Arsenic [6]	5.8 mg/kg for Arsenic [8, 9]
Waterfront Plaza	Non-Residential (Recreational)	Part 201 Generic Residential Cleanup Criteria [1, 2, 3]	Part 201 Generic Non-Residential Cleanup Criteria [1, 2, 3]	Part 201 Generic Non-Residential Cleanup Criteria [1, 3, 7]	Part 201 Generic Non-Residential Cleanup Criteria [1, 3, 7]
		1 mg/kg for PCBs [4]	9.1 mg/kg for PCBs [5]	9.1 mg/kg for PCBs [5]	1 mg/kg for PCBs [4]
				27 mg/kg for Arsenic [6]	5.8 mg/kg for Arsenic [8, 9]
Commercial Area 1, Commercial Area 2, Commercial Area 3, Commercial Area 4	Non-Residential/ Commercial	Part 201 Generic Residential Cleanup Criteria [1, 2, 3]	Part 201 Generic Non-Residential Cleanup Criteria [1, 2, 3]	Part 201 Generic Non-Residential Cleanup Criteria [1, 3, 7]	Part 201 Generic Non-Residential Cleanup Criteria [1, 3, 7]
		1 mg/kg for PCBs [4]	9.1 mg/kg for PCBs [10]	9.1 mg/kg for PCBs [10]	10 mg/kg for PCBs [13]
				27 mg/kg for Arsenic [11]	5.8 mg/kg for Arsenic [8, 9]

Notes:

[1] MDEQ (Michigan) Cleanup Criteria Requirements for Response Activity, Administrative Rules R299.1 to R299.50 effective December 30, 2013 pursuant to 1994 PA 451 as amended. Does not include comparison to Residential/Non-Residential Drinking Water Protection Criteria or Groundwater-Surface Water Interface Protection Criteria.

[2] All parameters except PCBs.

[3] List of specific PRGs (except DWPC and GSIPC) presented in Table 5 for COCs.

[4] TSCA Criterion for bulk PCB remediation waste in High Occupancy Areas without further conditions.

[5] Residential Risk-Based Concentration for PCBs in soil with a Target Cancer Risk of 10^{-5}

[6] Residential Risk-Based Concentration for arsenic in soil with a Target Cancer Risk of 10^{-5}

[7] All parameters except PCBs and arsenic.

[8] Residential Risk-Based Concentration for arsenic in soil with a Target Cancer Risk of 10^{-6}

[9] State Default Background Level. The minimum calculated RBC is below background; therefore, the value was substituted with background.

[10] Non-Residential/Commerical Risk-Based Concentration for PCBs in soil with a Target Cancer Risk of 10^{-5}

[11] Non-Residential/Commerical Risk-Based Concentration for arsenic in soil with a Target Cancer Risk of 10^{-5}

[12] Residential Risk-Based Concentration for PCBs in soil with a Target Cancer Risk of 10^{-6}. The minimum calculated RBC is below the TSCA Criterion of 1 mg/kg for Bulk PCB Remediation Waste in High Occupancy Areas without further conditions (40 CFR 761.61(a)(4)(i)); therefore, the value was substituted with this value.

[13] TSCA Criterion for bulk PCB remediation waste in High Occupancy Areas with further conditions.

TABLE 7

FINAL ECOLOGICAL PRELIMINARY REMEDIATION GOALS
FEASIBILITY STUDY REPORT
FORMER PLAINWELL, INC. MILL PROPERTY
PLAINWELL, MICHIGAN

Constituent	*95% UCL Concentration (mg/kg)*	*Avian PRG (mg/kg)*	*Mammalian PRG (mg/kg)*	*Final Ecological PRG (mg/kg)*	*95% UCL < Final Ecological PRG*	*Risk Management Required to Meet RAO*
Semi-Volatile Organic Constituents (SVOCs)						
Carbazole	0.083	---	0.672	0.672	Yes	No
Polycyclic Aromatic Hydrocarbons (PAHs)						
High Molecular Weight PAHs	19.9	69.6	59.6	59.6	Yes	No
Inorganic Constituents						
Cadmium	0.95	23.0	2.01	2.01		
Copper	143	634	6,334	634	Yes	No
Lead	181	140[a]/812[b]	7,212	140[a]/812[b]	Yes	Yes
Mercury	1.53	3.19	76.8	3.19	Yes	No
Selenium	0.74	---	9.09	9.09	Yes	No
Zinc	333	1,705	9,142	1,705	Yes	No

Notes:

PRG - Preliminary Remediation Goal
RAO - Remedial Action Objective
UCL - Upper Confidence Limit
mg - milligram
kg - kilogram
[a]- Lower end PRG based on LOAEL of 8.75 mg/kg-day
[b]-Upper end PRG based on LOAEL of 42.7 mg/kg-day

Table 8: Comparison of Major Remedy Components of the Alternatives

	Alternatives								
Remedy Component	**1**	**2A**	**2B**	**2C**	**2D**	**3A**	**3B**	**3C**	**3D**
No-Action	✓								
Excavation		✓	✓	✓	✓	✓	✓	✓	✓
Off-Site Disposal		✓	✓	✓	✓	✓	✓	✓	✓
On-Site Consolidation		✓	✓	✓	✓				
Institutional Controls		✓	✓	✓	✓		✓	✓	✓
Engineering Controls		✓	✓	✓	✓		✓	✓	✓
Future Land Use		Residential	Residential Non-Residential	Residential Non-Residential	Residential Non-Residential	Residential	Residential Non-Residential	Residential Non-Residential	Residential Non-Residential
Arsenic PRG									
Residential		7.6 mg/kg (Part 201)	7.6 mg/kg (Part 201)	6.4 mg/kg (risk-based)	5.8 mg/kg (SDBL)	7.6 mg/kg (Part 201)	7.6 mg/kg (Part 201)	6.4 mg/kg (risk-based)	5.8 mg/kg (SDBL)
Non-Residential		7.6 mg/kg (Part 201)	37 mg/kg (Part 201)	27 mg/kg (risk-based)	5.8 mg/kg (SDBL)	7.6 mg/kg (Part 201)	37 mg/kg (Part 201)	27 mg/kg (risk-based)	5.8 mg/kg (SDBL)
PCB PRG									
Residential		1 mg/kg (TSCA)	2.5 mg/kg (risk-based)	2.5 mg/kg (risk-based)	1 mg/kg (TSCA)	1 mg/kg (TSCA)	2.5 mg/kg (risk-based)	2.5 mg/kg (risk-based)	1 mg/kg (TSCA)
Non-Residential		1 mg/kg (TSCA)	9.1 mg/kg (risk-based)	9.1 mg/kg (risk-based)	10 mg/kg (TSCA)	1 mg/kg (TSCA)	9.1 mg/kg (risk-based)	9.1 mg/kg (risk-based)	10 mg/kg (TSCA)
Cost	$0	Not Calculated	$4,462,820	$4,998,195	Not Calculated	$9,424,482	$4,363,857	$4,875,232	$7,477,202

Note: Alternatives 2A and 2D have no suitable area for consolidation and capping of soils (i.e., there would be no designated non-residential/commercial portion of OU7). Because of this, Alternatives 2A and 2D do not meet the general intent of the Alternative 2 Series (i.e., on-site consolidation) and were not carried through the Proposed Plan. For Alternative 3D, the Waterfront Plaza is cleaning up to residential criteria for PCBs.

(Part 201) means Michigan Part 201 Generic Residential Cleanup Criteria
(risk-based) means site-specific risk-based concentration corresponding to 10^{-5} risk level
(TSCA) means the self-implementing PCB standards at 40 CFR 761.61(a)
(SDBL) means the Statewide Default Background Level

Table 9: Chart Comparing Cleanup Options with the Nine Superfund Remedy Selection Criteria

	Alt 1	Alt 2A/D	Alt 2B/C	Alt 3A/B*/C/D
Evaluation Criterion				
Overall Protection of Human Health and the Environment	○	●	●	●
Compliance with ARARs	○	○	●	●
Long-term Effectiveness and Permanence	○	●	●	●
Reduction of Toxicity, Mobility, or Volume through Treatment***	○	○	○	○
Short-term Effectiveness	N/A**	●	●	●
Implementability	N/A**	●	●	●
Alternative A Cost ($ millions)	$0	NC	-	$9.42
Alternative B Cost ($ millions)	-	-	$4.46	$4.36
Alternative C Cost ($ millions)	-	-	$5.00	$4.88
Alternative D Cost ($ millions)	-	NC	-	$7.48
State Acceptance	The State supports the preferred alternative (Alternative 3B).			
Community Acceptance	Will be evaluated after the public comment period			

● Fully meets criterion ◉ Partially meets criterion ○ Does not meet criterion

NC: Not calculated since alternative did not meet ARARs
* EPA's preferred alternative
** N/A: not applicable, since no remedy is being implemented in the No-Action Alternative
*** Alternatives do not result in a reduction of toxicity, mobility, or volume through treatment because it is impractical to treat large volumes of soil having low contamination levels